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## The Economic Value of Public Health\*

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I HAVE been asked to speak on the topic "Some Economic Aspects of Public Health," so that my terms of reference, I presume, are broad enough to permit an excursion into any one of several directions. As an outsider, I confess to little first-hand knowledge of the public health movement. But sometimes it may be useful for a rank outsider to look critically at the work a group of men are doing and tell them candidly what he thinks of it. I take it that that is the privilege which I have been given today and the function which I am to perform. Hence my title might well be "An Economist Looks at Public Health."

As I look at the public health movement there are various economic aspects that come to mind. There is the fact that bad economic conditions—low wages, unemployment, etc.—appear to generate a large proportion of the ill-health of the modern community; and the corollary that preventive medicine will be logically driven to attack these generating factors more than it has in the past if it is to attain its high objectives. There is the pressing problem of organization of the medical industry so that the ordinary citizen will look upon and deal with the doctor more as a preserver of health than a restorer of health. This problem, I believe, is very largely economic. There are the proposals for health insurance and state medicine that have received a good deal of attention lately in this country, economic proposals which, if adopted, would surely result in a marked extension of medical services, particularly on the preventive side. And then there are certain economic problems which the very success of the public health movement is creating, such as the problem of adjusting to mechanized industry the larger numbers of older workers who are now present in the population, thanks to recent progress in prolonging life.

On any one of these a great deal might be said. But there is another economic aspect of public health that appears to me to be first in importance and that is quite enough for me to discuss to-day. It is this: that ill health gives rise to a terrific amount of economic waste and that preventive medicine, in improving health conditions is

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performing a most valuable economic service, not only to those individuals whom it protects, but also to the whole community. From the economic standpoint preventive medicine ranks alongside of such great agencies of waste elimination as forest conservation, chemical research on the utilization of waste products, engineering projects to improve mechanical efficiency, modern accounting, and "scientific management." Indeed, it probably outranks most of these devices in its present, or potential, economic value to the community at large.

Let us look first at the negative side of the picture, the economic waste resulting from ill health and premature death. This makes it necessary that we consider briefly the idea, or the theory, of economic waste.

The term "waste" refers to the sterility of a thing, its unproductiveness, or its failure to be used. Essentially it means that a thing is not performing its due and proper function. Hence there is waste when good food is thrown away, when a house burns down, or when an automobile is wrecked. There is waste in the plant when a defective valve permits steam to escape from a boiler, or when men stand idle waiting for materials to come to them. And in the community as a whole, which from the standpoint of the economist is a vast industrial plant, there is waste when economic resources, labour, materials, land, machinery and equipment fail to create useful goods or services for the members of the community as efficiently as technical knowledge makes reasonably possible.

The sum-total of economic waste is appalling in the modern world, in spite of the huge volume of production that we do succeed in getting out. A number of you are no doubt familiar with Stuart Chase's excellent book "The Tragedy of Waste," in which he dramatizes and makes vital to everyone a subject which at first sight may appear dull and technical, and I can do no better than to quote from it to develop my point. Chase points out that in the United States (his argument applies just as well to Canada) there are four main channels of economic waste, as follows:

1. Production of non-essential, quite useless, or positively harmful things, such as many patent medicines, the services of medical quacks, some drugs and narcotics, adulterated food products, many things that sell by their looks but give no service, much advertising, stock-brokering and sales promotion, racketeering of various sorts, etc.
2. Idle man-power, on account of unemployment, sickness, accidents, parasitism of the leisure class (hoboes, many middle-class women without children or household duties, and the idle rich), etc.
3. Faulty production and distribution technique, responsible for unnecessary inefficiency within industrial plants, wastage of materials, loss or destruction of finished products, uneconomical distribution (as by many milk, bread and other delivery wagons serving the same street), etc.
4. Wasteful exploitation of natural resources, forests, fisheries, soil, and minerals, leading to unnecessary destruction or interference with future reclamation.

These channels of waste represent failure on the part of the community to get as much from its collective labour, from its raw materials and from its technical knowledge and capacity as it might. Their presence means that the volume of production is far less than it might be, and that everybody is so much the poorer. For if more were produced, if the economic cake were

larger, there would be more to divide, and each and everyone of us might have a larger slice.

It is impossible to estimate quantitatively the amount of these wastes with any degree of accuracy. Chase claims that in recent years about half the potential productive power of the American people has been wasted. This means that goods and services worth \$75,000,000,000 or more annually have not been produced—or consumed—and that this represents the monetary loss to the community at large. In other words, sufficient man-power, raw materials and technical knowledge are available in the United States to double the annual output of American industry and to double average American incomes and standards of living. This is a very rough and ready sort of estimate, as Chase frankly admits, but numerous other careful students testify that it is not unreasonable.

Let us assume, for purposes of argument, that the proportion of economic waste in Canada is about the same as in the United States, an assumption which is not unreasonable in view of the similarity of industrial conditions in the two countries. At present our national income, or the money value put upon the sum-total of our productive output, is in the neighbourhood of \$6,000,000,000 annually. Only about \$5,000,000,000 of this is available annually for direct consumption purposes, in view of the fact that \$1,000,000 or so is "saved," or invested in roads, railway equipment, factory buildings and other capital assets. This means that if our national income were divided equally there would be about \$2,000 available for each family of four in the country.

But the national income is not divided equally, and it seems impossible that it can be or should be. Hence we have many family incomes far above the \$2,000 level, and by virtue of this fact others must be well below it, many of them so far that they are utterly inadequate to maintain people in health and decency. Poverty, therefore, which is widespread enough in Canada, may be said to be a product of economic waste. On the other hand, if we could eliminate waste and double our national output, as Chase believes possible in the United States, we should have a fund of \$10,000,000,000 available for distribution among the 2,500,000 families of the Dominion, or an average of \$4,000 each. It would thus be possible to provide for a minimum income per Canadian family of about \$2,500 and still to have a good range of incomes above that point, to conquer poverty, and to raise practically the whole population to what we look upon now as a professional standard of living.

Here, then is the setting for a consideration of bad health as an economic waste. And here is the social and economic challenge to those who, like public health officers, are enlisted in the army of waste elimination. The stakes of the game are so high that they stagger the imagination.

Poor health involves economic loss in so far as it leads to loss of time in industry by workers, inefficiency and turnover of labour, premature death, and expenses of caring for those who are ill. Some ill health, of course, is to be expected. I understand that the medical profession cannot as yet guarantee us complete immunity from measles, cancer, tuberculosis and other diseases, not to mention the common cold, even under the most favourable conditions. But a great deal of illness and death is technically preventable, and it is the losses flowing from this that I propose to classify definitely as economic waste.

Illness as a cause of loss of time by industrial workers compares

in importance with unemployment. In Great Britain the average wage-earner lost about two weeks' work through sickness in 1926, and about five weeks through unemployment. According to a survey made by the United States Bureau of Labour Statistics some years ago industrial wage-earners in the United States lost about seven days a year through illness and about 30 days through unemployment. The Social Hygiene Council of Canada estimates in a recent pamphlet that the average number of adult males incapacitated by illness in Canada is 54,000. If the incidence of illness among women were the same (it is typically greater) the number of our working population constantly ill would be about 70,000, or some 2.5 per cent of all the gainfully employed persons in the country. By way of comparison, I might note that, according to rough estimates I have made, the average number of unemployed persons in Canada during the last ten years has been about 150,000, or some eight per cent of our wage-earners—a greater army of workers regularly standing idle than the Canadian Corps ever mustered during its stirring days of warfare in France.

How much of this illness and consequent loss of time from industry is preventable? Stuart Chase, basing his conclusion upon estimates by various American authorities, believes that about half of it might be prevented in the United States. The Social Hygiene Council makes the same estimate for Canada. Such calculations are of necessity extremely rough, but their validity is confirmed in some measure by the general testimony from the medical profession that the possibilities of prevention are tremendous.

Poor health leads also to inefficiency on the part of those at work and to labour turnover, both important causes of economic loss. "Without health," said the famous report of the British Health of Munition Workers' Committee, published at the end of the War, "there is no energy, and without energy there is no output. Health bears a direct relation to contentment, alertness and the absence of lassitude and boredom, conditions bearing directly upon industrial efficiency." The Committee found that the British munitions industry, under the urge of war conditions, was so driving workers that their health was being injured, and that the driving was really an uneconomical and wasteful policy, even for a short time, since it was shortly reflected in lessened output. Labour turnover is another factor of great importance in industrial inefficiency. It has been calculated that in American industry it costs from \$50 to \$300 or more to replace one worker with another. The total cost to industry of these two factors must mount into huge sums.

Premature loss of life is another huge source of economic waste. Every able-bodied, well-minded person is a potential producer, and if he fails to live out a reasonable span of life the community loses a portion of its productive power, just as surely as it does when a farmer's horses are killed in an accident, when a train is wrecked, or when a

factory building burns. Dr. Louis Dublin, the famous statistician of the Metropolitan Life Insurance Company, calculates that in the United States a capital value of about \$9,000 may be set upon the average male child at birth and about \$4,600 upon the average female. His method is to capitalize the excess of their probable future earnings over their costs of maintenance through life. Using the same method, he estimates that the capital value of the average American man at age 25 is \$32,000; at age 50, \$17,500; and at age 60, \$8,500.

Clearly it must be expensive to the American community to have any of these valuable capital assets destroyed a moment earlier than the strict necessities of Nature decree. But this destruction does take place. Dublin points out, in his fascinating book "Health and Wealth," that at present the average expectation of life in the United States is about 55.33 years for males and 57.52 years for females. With a proper application of preventive principles and practices, he believes that a great many deaths might be forestalled, and that the average expectation of life might be extended to about 65 years, a point that has already been reached by women in New Zealand. The total annual capital loss through premature (preventable) death in the United States he sets at the astounding figure of \$6,000,000,000!

A further item in this balance sheet of economic loss and waste consists of the expense of caring for the sick and disabled. Dublin estimates that in the United States the total cost of medical care amounts to more than \$1,000,000,000 a year. In Canada the total expenditures upon hospitals, sanitaria and asylums, apart from other items of medical care, exceed \$50,000,000 annually. Surely the expenditures made necessary by preventable illness may be considered as wasted, even although they might be replaced by others as large, or even larger, if our programme of health conservation were more adequate.

Before closing this distressing narrative, let us consider a few figures on the total losses from illness and premature death. Dublin claims that in the United States "sickness costs directly in lost wages, in reduced production, as well as in the necessary care, a total of \$2,250,000,000 a year" and that premature death accounts for further loss of \$6,000,000,000. Dr. J. W. S. McCullough, of the Ontario Department of Health, recently estimated that the total cost of illness in Canada amounted to more than \$300,000,000 annually and that the loss from premature deaths was about \$1,000,000,000. On the assumption that half of this illness is preventable the annual loss from this source that might be avoided is \$150,000,000—a good deal more than the huge Dominion deficit recently announced for the last fiscal year!

Thus it appears that preventable illness and death rank high in the list of economic wastes. And it is clear that those who strive and succeed to improve the public health are not merely humanitarians, salvers of pain and suffering, but also waste eliminators of the first importance.

Now let us turn to the positive side of the picture, the economic service rendered by the public health movement in conserving health and life. Here I touch on ground that is far more familiar to you in the audience than to me. But even a layman like myself is aware of the remarkable declines in morbidity and mortality rates which have occurred during the last few decades. These impressive achievements have been coincident with the rise of preventive medicine, and there is no one who will claim that there has not been a causal relationship between the two. Pasteur and Koch gave to medicine the germ theory of disease and the method of immunization and provided the tools for conquering certain acute communicable diseases that were veritable scourges of life no more than 50 or 60 years ago. Southwood, Smith, Budd, Murchison and other English pioneers put practical sanitation on a scientific basis two generations ago and developed the sanitary foundations of public health. Walter Reed, Col. Gorgas, and other Americans led in the control of insect pests that injured health and life. These men and others, within a half century, have built up a science of public health, and the findings of this new science have been put into effect, at least in part, through the departments of public health that have been established in every advanced community and through the preventive methods increasingly practised by physicians in private practice.

Just what the economic value of this public health programme has been it is impossible to say. I do not know of any rough monetary estimates of its value, similar to those I was quoting so freely some time ago, that have been worked out; and I do not have the information at my command that would enable me, at this point, to begin again talking in terms of billions of dollars. But when we consider, to take a few examples, that the average expectation of life at birth has increased in England and Wales by about 16 years since 1838, and in the United States by more than 8 years since 1901; that the crude death rate in New York City declined from 28 per thousand of population in 1868 to 12 per thousand in 1925 and the infant mortality rate from 250 in 1875 to 63 in 1925; and that typhus, smallpox, diphtheria, scarlet fever, diarrhoeal diseases and other scourges have been almost eliminated or so brought under control that they hold out little danger to life in communities where public health services are adequate; and when we consider such estimates of loss from bad health as have been cited above—then it must be abundantly clear that the value of the public health achievement in any modern community, from the crass economic standpoint alone, has already been enormous.

The public health movement, I venture to say, has paid for itself over and over again. The saving in infant lives for which any adequate public health service is responsible alone repays the community, in terms of dollars and cents, for the full expenses of maintaining the service and much more. May I illustrate the point by referring to the experience of Toronto? In 1910, the year in which the late Dr. Hastings

became head of the City's Department of Public Health, the infant mortality rate was 148.9, while the expenditures of the Department were \$92,958. In 1930, the infant mortality rate had declined to 75.2, while the Department's expenditures had risen to \$974,517. Beyond question the increased activity of the Department accounted for a very large proportion of the drop in the infant mortality rate. In 1930, the number of live births in the city was 13,697, and the number of infant deaths 1,028. But if the 1910 mortality rate of 148.9 had obtained in 1930 the number of deaths would have been increased by about 1,000 infant lives. The capital value of these infant lives saved, on the basis of Dublin's estimate of a male child being worth \$9,000 at birth and a female \$4,600, or an average of \$6,800, amounted therefore to \$6,800,000—surely overwhelming economic justification for the city spending about \$900,000 more on public health than it did 20 years ago!

But it is not sufficient to rest on our oars and be content with what we have done. I have already said a good deal about the terrific economic wastes incidental to the bad health that is still present, in spite of the remarkable achievements of the public health movement. And, as I have noted, there is abundant testimony that a vast amount of sickness can be prevented, if only adequate provision is made for extension of the principles and practices of preventive medicine. This extension, no less than what has already been done, ought to return huge dividends.

Consider, for example, the possible saving to the citizens of Toronto from a further decrease in the infant mortality rate. The 1930 rate of 75.2 is much too high. Dublin believes that "if the public health and medical knowledge which we now have were made available more widely to mothers during their child-bearing period, the infant mortality rate could be reduced to well below 30." Already in New Zealand the rate has fallen below 40, and this point has been approached in Vancouver and Victoria. It is conservative to presume that in Toronto the rate might be cut to 40. If this rate had prevailed in 1930, about 480 of the 1,028 infants who died would have lived, and their preservation would have represented, on the basis of Dublin's estimate of the capital value of a baby, an increase in the capital assets of the community amounting to \$3,264,000!

But at what expense, it may be asked, since we are still pursuing this subject in cold-blooded economic terms? What would the City Hall have to pay out to save these few infant lives? And how much more would the already over-burdened taxpayers have to contribute? Perhaps the officials of the Toronto Department of Health could tell us fairly definitely. I don't know with any degree of certainty, but I am quite sure that the expense would be vastly less than the saving that I have mentioned. Dr. Dublin argues that an expenditure of \$2.50 per capita of population on public health is sufficient to bring about such an improvement in the infant mortality rate as I have

predicated above, as well as to reduce the crude death rate by two points, increase the average expectation of life by five to seven years, and cut down the incidence of morbidity very considerably. These estimates are averages based upon American experience, but it is not unreasonable to apply them to Toronto in view of the fact that circumstances of life and health here are not greatly dissimilar from those prevailing in typical American cities. In 1930 the municipality of Toronto spent about \$1.55 per capita on its public health services. If Dublin's estimates are at all correct for this city it would appear that by spending about 95 cents per capita more per year, or \$600,000 altogether, we might achieve the saving in lives and health that he outlines, and that this increased expenditure would be far more than offset by the economic value to the community of one item alone, the preservation in infant lives.

I have been speaking too vaguely, perhaps, about saving to the "community." That may sound all very well in an academic discourse but it may not prove convincing to a hard-headed set of aldermen who believe that municipal economy is always gained by curtailment of immediate expenditures. But I think that even the most determined guardians of the public purse can be convinced of the importance of generous provision for public health by a proper presentation of such data as I have been discussing, probably worked out in the terms of the particular municipality whose interests they represent. It can be shown, I believe, that the saving to the community actually takes dollars and cents form in lower sickness expenses and steadier wages to individuals, in decreased production costs to employers, in increased productive power, social income, wage scales and standards of living to the members of the community at large. All of these factors represent increase in the capacity of citizens to pay taxes to support health and other activities. And even the public authority may benefit directly from an extension of public health programmes, through having to spend less upon such charitable and welfare items as hospitalization of indigents, poor relief, old age pensions, and mothers' pensions. A good deal of the poverty which confronts us is induced largely by illness or premature death of the breadwinner. In Toronto the 1930 bill for hospitalization of indigents amounted to \$976,229, and large grants were made also for other welfare services. Is it too much to believe that an additional annual grant of \$600,000 to the Department of Public Health, which might be expected to bring about the health standards Dr. Dublin considers possible, might actually lead to the saving of this amount in other welfare services and so represent no net additional expense to the city of Toronto?

Finally, may I quote Dublin: "There is no greater opportunity for a quick and more certain return on any investment than an investment in public health. The people of the United States and, in fact, of the whole world, have not waked up to the enormous possibilities of profit in preserving life and health."

# Water Purification\*

GEORGE G. NASMITH, C.M.G., D.Sc., D.P.H.†

**A**T the beginning of the present century about 35 people out of every 100,000 in America died of typhoid fever. For every death there were approximately 12 cases of the disease, so that in every 100,000 of the population there would be about 420 cases of typhoid fever. Most of this typhoid fever came from drinking water contaminated with human excretions. In addition to typhoid, many others (all over the world) died from cholera, dysentery and other water-borne diseases. Today in civilized countries very few die from these diseases. What is the reason?

As stated, the diseases mentioned, and others of lesser import, were largely conveyed from man to man through contaminated water. Man discovered that he could remove or destroy the dangerous germs present in contaminated water and, when he did so, most water-borne diseases disappeared as if by magic. Today in civilized countries, municipal water supplies are made safe by filtration and sterilization. It costs money, but it pays.

Take the city of Toronto as an example. Before the year 1910, after every easterly storm, there would be hundreds of complaints of dysentery. After a lapse of two or three weeks a crop of typhoid fever cases would develop, but nobody connected the east winds with typhoid fever, though it was known that the waters of Lake Ontario in the vicinity of Toronto were contaminated by Toronto's own sewage. It was discovered in later years that easterly winds carried sewage-laden water to the intake pipes.

After Exhibition time at the end of August, the people who had flocked to Toronto for the Fair returned to their homes and many of them developed typhoid fever. One physician practising in the country about 20 miles north of Toronto attended 43 cases of typhoid fever one autumn after Exhibition time, and on inquiry discovered that without exception his patients had been to the Toronto Fair. Some of the cases which originated in Toronto in those days started small epidemics of typhoid fever in their own homes and localities in different parts of the country.

Finally, a group of public spirited women in Toronto began agitating for a filtration plant to purify Toronto's water supply and when, to appease them a vote of the people was taken, to the surprise of most people the filtration plant and sewage treatment plant projects both carried by liberal majorities, Toronto people thereby clearly indicating that they did not want to drink polluted water or die of typhoid fever. Today the death rate from typhoid fever in Toronto is about one per

\*The second of two articles on Public Health Engineering which Dr. Nasmith has prepared at the request of the Editorial Board.

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100,000 population. Such experiences in Canada and elsewhere could be multiplied where citizens, realizing that the solution was within their own grasp, gathered themselves together and demanded protection from preventable diseases and not only expressed a willingness but also an eagerness to pay for that protection.

#### SOURCES OF WATER SUPPLY

There are two possible sources of municipal water supplies:

- (1) Deep wells and springs.
- (2) Surface water supplies.

The first, though numerous, are rarely practicable for very large communities because of the immense quantity of water required. As a rule, waters from deep wells or flowing springs are uncontaminated and safe, though they may contain objectionable amounts of salts which make them unpalatable or hard. They frequently require some form of treatment, such as aeration or softening, to improve them.

Most large municipal water supplies are obtained from surface sources, such as lakes and rivers, which provide never-failing quantities. Such surface waters, with the exception of some mountain rivers or lakes, are more or less contaminated, dirty and potentially dangerous and for this reason require treatment by filtration or chemical disinfection, or both. As people become better informed, they are less disposed to drink untreated water, just as they are to drink unpasteurized milk. They have gradually learned that inspection and protection of water areas from which surface water supplies have been gathered cannot ensure safe water. They know that it is impossible to keep people and contamination away from such gathering grounds at all times and experience has shown that surface water supplies, in spite of every effort, frequently do become contaminated and epidemics have resulted therefrom. Cities which have obtained their water supplies for many years from inspected and controlled gathering grounds, have resorted to chlorination (in recent years), and some are to go farther and filter their supplies.

More and more people are demanding not only safe water but clear, sparkling, colourless water, and are willing to pay for these qualities. Colour, though in itself harmless, has become objectionable to a more discriminating public which formerly paid little attention to the appearance of their water supply and, as in the case of the city of Ottawa, have voted large sums of money for the purpose of converting brown, objectionable looking drinking water supplies into clear, sparkling and colourless ones.

The waters from rivers almost invariably contain suspended matter in variable quantities, such as particles of vegetable debris, mud and living organisms. The waters of rivers flowing through rocky countries may be comparatively clear but coloured. Where rivers open out into broad expanses and currents slow down, much of the suspended matter

settles out and the water is improved thereby. Advantage is sometimes taken of this tendency to construct impounding reservoirs and allow natural clarification to take place. By sufficiently prolonging the period of storage in reservoirs, the death of most of the dangerous disease germs present is ensured. Impounding reservoirs, however, have the defect of permitting heavy growths of algae to occur, which may cause objectionable tastes in the impounded water. Short circuiting may also take place in storage reservoirs and permit dangerous water to pass through them quickly. For these reasons municipalities which formerly relied upon such reservoirs as the sole method of safeguarding their water supplies have, in many cases, added chlorination or filtration, or both, to ensure an absolutely clean and safe product.

#### MEANS OF PURIFICATION

These are three in number:

- (1) Storage
- (2) Filtration
- (3) Chlorination

##### *Storage*

Of the first, little more may be added to what has been already said above, particularly as artificial storage methods are rarely if ever deliberately resorted to in Canada. In order to realize what settling tanks alone can accomplish in the treatment of waters, one must see those used for settling Mississippi or Missouri River water from which enormous quantities of mud must be settled out before filtration. As much as 40 tons of solids per million gallons have been moved from the river waters in middle west and southwest states by sedimentation alone.

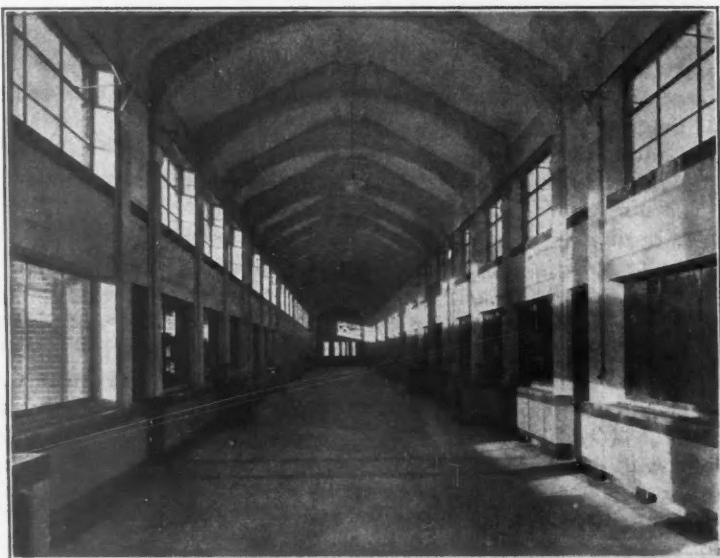
##### *Filtration*

This process is essential for the production of an absolutely clean water. There are two types of filtration plants, the slow sand system and the rapid sand or mechanical system.

In the slow sand system, the raw water is allowed to pass into chambers on the bottom of which are beds of graded sand 20 to 30 inches deep laid upon gravel and properly underdrained. The water, which is retained on the surface to a depth of 3 to 4 feet, slowly percolates downward through the sand and gravel beds into the collecting tile beneath, and thence into clear water reservoirs. Mud, debris of all sorts, algae and other visible material in the raw water, as well as most of the invisible bacteria, are retained on the surface of the sand bed or held in the interstices of the sand, particularly near the surface, so that the water which goes through the sand beds is clarified and purified.

The slow sand process is particularly suited to the filtration of

comparatively clear waters, since these do not plug the surface of the sand so rapidly and therefore allow filtration to proceed uniformly. When the surface of the sand bed finally becomes dirty enough to stop the passage of the water sufficiently the water is drained from the sand filter beds, the surface sand removed, washed, replaced and the process begun over again. The slow sand process is comparatively foolproof and quite effective for certain waters. However, as such beds will filter, on the average, only about 2 to 6 million gallons per acre per day, the area required for a slow sand filtration plant is large and in Canada, on account of freezing, the beds must be covered. Because the mechanical type of filtration plant is compact, is suitable for all waters,



OPERATING GALLERY, FILTRATION PLANT, OTTAWA

removes colour and filtration proceeds at a high rate, this method is practically the only one considered today.

The rapid sand filter depends largely for its efficiency on treatment of the water before filtration by chemicals. This process is called coagulation. The chemicals employed are usually aluminium and iron salts, which, when mixed with water in small quantities, react with salts in the water to form a coagulum which gathers up the dirt, bacteria and some of the colouring material into small jelly-like masses called floc. This floc forms slowly but can be made (by suitable mixing devices) to form rapidly into denser particles which will settle more rapidly. The most effective mixing device known is the "Gore Spiral Flow Chamber" devised by William Gore of Toronto at the Ottawa Trial Filtration Plant.

Proper floc formation is perhaps the most important factor in the operation of a mechanical filtration plant. It is affected by a number of things. The acidity or alkalinity of the water increases or decreases the amount of coagulant required. Coloured waters, for example, usually coagulate best at a pH of from 5 to 5.3. If the raw water happens to have a pH of about 7, this means that the pH must be reduced to nearly 5 before coagulation is complete. This reduction in acidity may be brought about by the use of acid, but usually the alum itself is used for the purpose. This is expensive because every grain of alum per gallon of water treated means an additional cost for coagulant of \$2.14 per million gallons of water treated. Industrial wastes in water supplies sometimes necessitate additional and even excessive quantities of alum for good coagulation and make the process expensive. When the pH of the water has to be materially lowered for proper coagulation, the filtered water may dissolve iron, so that rust or red water troubles follow. For this reason, such waters after filtration are usually treated with lime to raise the pH, inhibit solvent action and prevent red water trouble. It is apparent that the lower the pH necessary to produce coagulation, the more lime will be necessary to restore the original alkalinity and, therefore, the greater will be the cost of treatment.

Most waters, even those of the great lakes, vary in the quantity of alum required for coagulation from season to season, or even from day to day. Comparatively small amounts of undesirable chemicals in water contaminated with sewage or trade wastes may necessitate sudden changes in the amount of alum required. Freshets, rains, high winds and other factors may rapidly change the chemical content in the raw water and require equally rapid adjustments of coagulants and corresponding readjustments later on, when conditions have again become normal. It is obvious, therefore, that natural waters of constant composition are rare and it is apparent that constant attention must be paid to the adjustment of chemicals in the treatment of water in order to obtain the best results. If care is not exercised in the proper coagulation of water, uncoagulated alum may pass through the filter and coagulate later on in the distribution system, producing more or less turbid water.

Odours are sometimes objectionable in water and may require aeration to dispel those of a gaseous nature. During one period at Ottawa it was found that the raw river water after chlorination had a weedy taste, but that the filtered chlorinated water from the experimental filtration plant derived from the same inlet was quite tasteless. Evidently treatment with alum had removed the taste-producing substance. There are many soluble taste-producing substances that are not removed, or only partially removed, by coagulation and filtration and these require other forms of treatment.

One of the most objectionable substances in water is phenol or similar chemicals which in minute quantities combine with chlorine to

produce exceedingly objectionable taste-producing substances. Fortunately tastes can be prevented by three well tested methods. By adding small quantities of ammonia to the water before chlorination, tastes are frequently prevented. Super chlorination, followed by the removal of the excess chlorine, with sulphur dioxide or other suitable chemical has also proved to be efficacious in Toronto. The use of activated carbon, either in powdered form mixed in the water or in beds through which the treated water is passed, has also been found to remove objectionable tastes in water.

#### *Chlorination*

Practically all drinking waters, whether filtered or not, are now chlorinated to destroy disease-producing bacteria. The quantity of chlorine may be as low as one-tenth of a part of chlorine to a million parts of water, though usually somewhat larger quantities are employed. Chlorine has been one of the greatest benefactors to humanity ever discovered and has been responsible for saving literally millions of lives, both in war and peace, as well as preventing uncalculable amounts of sickness, ill health and unhappiness. In spite of some uninformed opinion to the contrary there are absolutely no harmful effects from drinking chlorinated water, even though it tastes of chlorine.

Chlorine has other remarkable properties in connection with the treatment of water which are more or less unexplained. For instance, at Windsor in summertime the water sometimes contains a good deal of algae which seriously interferes with the normal operation of the filter plant. These algae do not settle in the settling tanks and, passing on to the filter beds, plug them so quickly that filter runs are reduced to three hours or even less. Resort was had during such difficult periods to coagulation with lime and ferrous sulphate, which increased the filter runs to seven and eight hours. However, it was discovered that one-tenth of a part per million of chlorine added to the raw water before coagulation with alum completely changed the picture. The coagulum came down in the form of strings as much as an inch long which settled rapidly and resulted in filter runs of 60 to 70 hours. This simple treatment eliminated this worry and made it possible to deliver plenty of water under all conditions.

#### *Filtration Difficulties and Filter Washing*

There are many mechanical difficulties in connection with filters which need only be touched upon here. Mudballs sometimes form in filters and have to be removed. Accumulation of algae or other materials tends to plug the filter and pull the surface of the sand away from the walls, or form cracks which allow unfiltered water to pass through. Air also accumulates in the interstices of the sand, particularly when algae troubles are present, and the water is supersaturated with oxygen which is released in the sand beds and obstructs the flow of water through them. Washing with a high rate of flow in order to

agitate the sand thoroughly and allow every grain to rub against its neighbour removes most of the materials which cause the trouble. Sometimes thorough agitation with a pressure hose is necessary to break up plugged parts of the filter beds.

When the flow through the filters is so low that it is no longer economical to run them, the sand filters are washed. The beds are drained down and clean water is allowed to flow in through the gravel at the bottom and rise through the dirty sand. The more rapidly the water flows in, the more vigorous is the wash and the more thoroughly is the sand broken up and the individual grains rubbed against one another and scoured. The dirty water rises and flows over into wash



FILTER BEDS, OTTAWA FILTRATION PLANT, SHOWING FINE GRAVEL COVERING COLLECTING PIPES AND WASH WATER TROUGH. FILTER SAND WILL BE PLACED ON THE GRAVEL AND WILL ALMOST TOUCH THE BOTTOM OF THE WASH WATER TROUGHS.

water troughs and thence into the drain. After the bed has been thoroughly washed, which usually requires about three minutes, the current of wash water is slowly stopped, the sand allowed to settle in place, raw water allowed to flow on to the surface of the bed and the process of filtration started over again.

In general, it may be said that the art of water filtration has become standardized and that, though improvements will undoubtedly develop from time to time, no very material changes are likely to occur in the essentials of the process. In this respect water purification differs materially from sewage treatment, which is an art in the midst of its development and which still has a long way to go before perfection will be attained.

# The Place of Mental Hygiene in the Public Health Programme\*

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**I**N order that the place of mental hygiene in the public health programme may be discussed, it is necessary, first of all, to state the objectives of the public health programme.

It is generally agreed that public health is the communal organization which has for its aims the prevention of disease and of abnormal conditions of the body, and the promotion of a full development of the capacities with which each individual is endowed.

We understand that public health is a state responsibility because, if for no other reason, it is a matter of self-interest for the state to lessen the economic waste resulting from ill-health, disease and premature death, and to increase the efficiency of the individuals who make up the state in order that their productiveness may be augmented both in quality and in quantity.

The present-day public health programme has taken time to evolve. The modern public health programme, in its beginning, was but part of a general reform which sought to minimize human suffering and to increase human happiness. In its development, dealing with urgent problems and evolving the technique required for the application of new knowledge, this final objective may have been lost sight of temporarily, but it has always been there and it has been the inspiration for much of what has been accomplished.

To-day our civilization requires citizens who are competent and able to co-operate with others. Public health is to be regarded as one of the organized social forces which is used to meet this requirement and so to make this world a better and a happier place for man to live in.

Historically, we see the development of public health, first of all, with attention being given almost solely to environment and later being focussed on communicable disease control, and we finally reach our present position of an understanding of the importance of the individual and of individual responsibility for health.

This changing emphasis does not imply that either environment or communicable disease control is any less important than it was formerly. What it does mean is that, as a result of increased knowledge and experience, a broader and better-balanced programme of public health work is evolving.

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To include mental health in the public health programme which, hitherto, has been concerned with physical health does not imply that less attention is to be given to the physical side. It is a recognition rather that it has been found impossible to divide an individual into two parts—one physical and the other mental—and to deal with each separately.

The mind is greater than the body, therefore mental health is of greater value to the individual than is physical health, and it means more to him in the way of progress, efficiency and happiness. However, it is not a case of deciding as to which is the more important and pursuing that particular one; they are so linked together, in many ways, that it is practically a question of both or neither.

Public health has been handicapped in its development by those who have attempted to separate the inseparable and to define hard and fast boundaries for public health activities. The gravest error has been an insistence that curative and preventive medicine can be divided and that public health must limit itself strictly to the preventive field.

That this cannot be done is obvious as regards tuberculosis and the venereal diseases, where treatment of the case plays a very important part in the control of the disease. It is equally true that early treatment of abnormal conditions of the body is preventive. Early treatment is essential if we are to lessen the premature occurrence of the degenerative diseases and to control cancer.

Just as it is impossible to separate curative and preventive medicine, so it is impossible to separate physical and mental health. It is the individual who must be dealt with, not a physical or a mental entity. Just as we study the actions of one or other organ of the body in relation to the rest of the body, so we should, at the same time, take into consideration the actions or behaviour of the individual to whom the organs belong.

Our vital statistics do not show the deaths which are due to mental disease. Deaths are usually certified to according to the condition which is immediately responsible, such as pneumonia. A large number of individuals do die during the course of mental illness, and mental conditions constitute a public health problem because they are so frequently the indirect cause of death.

Public health is responsible for the organization required to prevent or control all preventable diseases. On account of the limitations of our knowledge, this control still lies chiefly in the field of the infections. Public health is, however, just as much concerned with the prevention of one disease as of another, whether this be the control of typhoid fever through sanitary measures, of diphtheria by means of immunization, of puerperal sepsis through the provision of medical and nursing care for all mothers, of lead poisoning by the control of industrial hazards, or of syphilis by the treatment of the case. It appears

obvious and logical that the prevention of mental disease warrants a definite place in the public health programme of disease prevention.

The change in the public attitude with regard to mental diseases from the one which considered only the institutional care of the case to that which is interested in prevention and early treatment is perhaps the greatest achievement of the past decade because it has been so difficult to accomplish and because it is so fruitful in its promise of results in the increase of human happiness.

The belief in the supernatural cause of physical disease was difficult to overcome, and it was even more so where mental disease is concerned. Up to 1770, Bethlehem Hospital in London, known as "Old Bedlam," was a show place to which people went for amusement. It was in the midst of the French Revolution that Pinel freed the insane from chains, cages and brutal keepers. His action was followed by a similar reform in England when William Tuke of the Society of Friends built The Retreat at York. These reforms marked the beginning of a more humanitarian treatment of the insane.

It was Clifford Beers, a graduate of Yale, who had spent from 1900 to 1903 as an inmate of several mental institutions, who founded the mental hygiene movement. He it was who aroused public opinion with regard to the need for better care for those who were already mentally ill and as to the obvious desirability of the prevention of mental disease. His book—*A MIND THAT FOUND ITSELF*—is a human document, which has been of tremendous value and fruitful results.

Unfortunately mental disease is not uncommon. In Canada, there are more beds occupied in mental hospitals than there are in general hospitals. The July, 1930, Bulletin of the Canadian National Committee for Mental Hygiene informs us that there are approximately thirty thousand persons in mental institutions in Canada; that in 1929, over eight thousand insane were admitted to such institutions, and that there was an increase in the population of these institutions of over thirteen hundred during that year. Last year the increase was approximately 2,000. According to Haven Emerson, "Approximately 4.5 per cent of all persons born in the state of New York may be expected, during the life of their generation, to suffer from a mental disease that will require hospital care."

The proper care of this vast army of persons who are mentally ill means for them a better and quicker chance of recovery. Public health is therefore interested in the provision of proper institutional care for those suffering from mental disease. Whether or not, in any particular place, the public health organization is administratively responsible does not alter the fact that the public health authority will require that such care be provided in some satisfactory manner.

I should like to point out that the cost of care for mental diseases and the economic loss resulting from them are so great that they over-

shadow other expenditures. This is a matter of practical importance, for the longer governments are faced with increasing capital expenditures and maintenance costs for mental institutions, the more difficult it is to secure money for other public health purposes. If, through preventive measures, the number of new cases requiring institutional care are diminished, and when, as a result of better treatment, cases are returned to their homes sooner, this will not only mean better mental health, but it will put a brake on the mounting costs for mental institutions.

In Canada, the provinces have assumed responsibility for mental hospitals, and these institutions are, therefore, a part of the provincial health programme, whether either directly or indirectly under the provincial health department.

Necessary as is the provision for institutional care, it is not through such institutions that the hope of prevention lies.

The prevention of mental disease depends upon giving to the individual an understanding of himself. Just as we are trying to improve nutrition by instruction which leads to an understanding of the value of the various foods, so will the individual require instruction as to how to meet the problems and difficulties of life.

Mental hygiene should be part of the programme for popular health instruction whose place on the public health programme is such an important one. The basis of all the hygienes is a popular understanding. That is, the public must be informed as to what the problem is, what it means to the community, to the family and to each individual personally. This is, in itself, quite an undertaking, because the public are comparatively ignorant with regard to mental disease, and there is much superstition and prejudice to be overcome. Bringing mental hygiene into public health breaks down this prejudice to some extent for it is evidence that "mental" is not something entirely different and set apart. It also provides for the linking of physical and mental health teaching. It is impossible to prepare a booklet on child care, for example, without considering both physical and mental hygiene, so why not do it thoroughly and completely.

Results, we are aware, come from the application of knowledge, and not merely from its spread. However, knowledge must precede practice, and we have viewed the successful campaigns against tuberculosis and the venereal diseases which began with spreading wide the knowledge which was available concerning these particular diseases. First in order in any public health campaign comes public understanding through popular health instruction. Therefore, one place which mental hygiene has in the public health programme is in that part of the programme which is known as popular health instruction, the aim of which is to keep the public informed as to the prevention of disease and the maintenance of health.

In the evolution of public health practices, it has been found that

those movements which have to do with the individual cannot be carried on advantageously as separate and distinct activities. By this I mean simply that health work on behalf of the individual or the family is generalized health work. You cannot deal successfully with the infant in the family if you disregard the rest of the family. The public health activity may be carried on under different names—Child Welfare, Tuberculosis, etc.—but you will find that if the work is being thoroughly done, what is demonstrated and taught in the home is practically the same in every case, with perhaps varying emphasis on certain details. How, for instance, can tuberculosis work succeed that neglects any phase of child hygiene, and certainly child welfare work cannot ignore tuberculosis in any way.

Similarly, mental hygiene is not to be considered as a thing apart, but as an integral part of all the health work which is done for individuals and families.

In the minds of many persons, there are only two problems in the mental field, the one being mental disease, and the other mental deficiency. There is, however, another and more serious problem, which is concerned with the vastly greater number of individuals whose lives are unhappy and ineffective because of fears and anxieties and their inability to mix with other people or to adjust themselves to work. These individuals are neither defective nor diseased; they are mentally unhealthy and are comparable to the person who is below par physically.

Proper training from the first day of life is the preventive measure for this group, hence the importance of mental hygiene in infant hygiene work.

Mental hygiene clinics are required, as are chest clinics with diagnostic facilities, so as to make available a centre where a mental hygiene diagnosis can be made and advice given. Such clinics are an essential part of the public health organization. They provide for the early diagnosis and treatment of cases, many of which would otherwise progress to serious mental disease. The mental hygiene clinic is essentially preventive in its work. Its chief field of activity lies among children who are presenting symptoms or indications through their behaviour of an early unhealthy mental condition, and who require care on that account. Facilities for early diagnosis are essential in the public health programme in any field.

Mental hygiene, in the sense that it leads to an understanding of human behaviour, has an unlimited field. Many of those who use it do so as an aid in their responsibility of dealing with individuals in whom problems have already arisen. Naturally and rightly they feel that if they can acquire an understanding of the individual by calling mental hygiene to their assistance, then rather than dealing blindly and ineffectively with a problem, they will be able to do something with the individual as a whole.

If mental hygiene is to be applied, then it must, first of all, be

carried into the home. The application of mental hygiene requires, if children are to benefit, that parents be brought first to understand and then to apply. This is not easily put into practice, because none of us, despite what we may say, enjoys having his own shortcomings pointed out to him. Yet that is what must happen with most of us. Parent education must precede child guidance. You do not attempt to instruct the baby himself with regard to his need for orange juice; that instruction is to be given to the mother. It will be difficult to persuade many a mother that her good boy, who prefers her company to playing with other boys, is mentally unhealthy.

In my opinion, real success or relative failure awaits mental hygiene, depending upon the success or failure of the public health nurse in carrying mental hygiene into the home.

Partial success can be obtained through popular health instruction, parent education groups and mental hygiene clinics, but the number reached by these means alone is too small to have a wide influence. There is one group of workers who go into thousands of homes each day in Canada. They go to give nursing care and health supervision. If their health teaching include mental hygiene, then these thousands of homes which they visit will be gradually influenced by mental hygiene principles. Not only is the teaching of the public health nurse truly preventive because it is given before the damage is done, but it is followed up by subsequent visits.

Group instruction is recognized as a valuable means of informing the public, and it is accepted in the health programme. Most of the group instruction is given by a public health nurse, and she can use this group method in her mental hygiene teaching. However, group instruction does not replace individual instruction and supervision in the home. It is because the public health nurse goes into the homes of all classes that she has the opportunity which others have not of understanding the home environment and of influencing it for good in many ways.

The home is the place where the child is trained, and it is the home which is of paramount importance in shaping child life. The home is the place where problems arise, and it is from early disorders in the home that mental diseases or abnormalities take their source. The public health nurse has access to the home, where she is the health teacher; she can discover there those individuals who require assistance. It appears to me that the public health nurse is the key to the situation.

It is not loading a new burden on the public health nurse; it is rather supplying her with a new method of approach. It is not expected of the public health nurses that they become psychiatric workers, but they will be better public health nurses because, by means of mental hygiene, they will be able to handle their present responsibilities more intelligently.

It is fair to say that, at present, progress in many of the hygienes

is held in check because of a lack of understanding of the emotions and behaviour of those with whom the public health worker must deal.

What mental hygiene gives to the public health programme is a knowledge of how to deal with individuals through an understanding of human behaviour. Mental hygiene also points the way to dealing with problems through an approach to the whole individual rather than to the problem itself which, in reality, is but a symptom, and we know that it is fundamentally sound to treat causes rather than symptoms.

The relationship between poverty and sickness is well recognized. In attempting to solve the sickness problem, it is obvious that if the poverty associated with it is due to a mental condition which prevents the bread-winner from earning a living, it is ridiculous to attempt to deal with the family concerned in any way other than by whatever is the proper care for the mental condition. Not understanding this, or not recognizing that there is a mental problem is the cause of much wasted time and effort on the part of relief-giving and health agencies.

What has been said of the home is equally true of the school and industry. In both of these fields also, the health worker who is to do the best work must have an understanding of mental hygiene. To adjust the individual to his school or work environment is as essential to his well-being as it is to see that there is adequate ventilation in the school or the workshop.

Progress in public health has been advanced by the higher standards of education secured for the masses. The education and training of mental defectives will help to make that group more readily accessible to public health instruction measures, which is a matter of some practical importance when the mental defectives are parents, or when some member of their household is suffering from a communicable disease.

To sum up then, I would say that mental diseases should be dealt with in the public health programme as preventable diseases; that facilities should be provided, by mental hygiene clinics, for diagnostic service; that mental health should be promoted, in the public health programme, by popular health instruction, parent education groups, and particularly by the public health nurse in the home, at the school and in industry; that mental hygiene is not a thing apart; that mental health cannot be divorced from physical health; and that our ultimate goal of health for the individual through public health must include both physical and mental.

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# Aids to Registration in Vital Statistics\*

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**I**N choosing the subject of this paper, I had in mind my own experience and difficulties years ago in organizing a provincial department of vital statistics in a vast and new territory. The usual machinery for enforcing registration which is effective in older countries was entirely ineffective in new Alberta. Not only were the tremendous distances and lack of communication great obstacles, but the diversity of nationality and language added its quota to the chaos. Apathy and even direct opposition had to be overcome; newcomers from the middle and western United States, where vital statistics registration was practically non-existent, resented any delving into their family history; central Europeans scented the bogey of militarism in birth registrations and were openly hostile, while the Indians were nomadic and suspicious of any inquiries regarding themselves, especially their matrimonial affairs. Added to this was the usual lack of interest in vital statistics on the part of the administrative authorities, and the periodic struggle to secure adequate funds to carry on the work in a satisfactory manner.

Faced with all these obstacles, a provincial registrar had to adopt measures that might seem strange, crude, or unorthodox to the departments of vital statistics of older countries; but every channel that would lead to the creation of a system had to be explored and tested and those experiments that were found profitable were retained, while the others were rejected after due trial.

## *The Problem of Obtaining Records*

The first problem is the obtaining of records, and this necessitates a good system of district registrars. This is a real problem in a country where, outside of the cities or thickly settled districts, no provincial or municipal officials are available. Before a bureau of vital statistics can aspire to 100 per cent efficiency, it must have a staff of district registrars who are sufficiently wide awake to let nothing slip past them in the way of registration.

Can this be attained by legislating that a certain group or class of men shall be registrars in their district, men such as secretaries of municipalities, secretary-treasurers of school board districts, commissioners of mining districts, and so on? This system was tried out in Alberta and resulted in failure. The recommendations of the model act were followed by appointing secretary-treasurers of municipalities. A municipality, however, proved too large a district for a single registrar;

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moreover, settlements of different nationalities and tongues were found in the same municipality, so that it was necessary to appoint deputies to assist. The registrars had no control and very little supervision over these deputies, the result being delay and neglect. When registrations failed to reach the Department, it was difficult to know where to place the blame.

The next experiment was the appointment of secretary-treasurers of school board districts; these districts, being much smaller than municipal districts, promised to be more easily handled, the secretaries being in closer touch with the residents, and more likely to take an interest in the births of the school children of the future. On the whole this also proved unsatisfactory, owing to secretary-treasurers being changed almost every year and the boundaries of school districts frequently altered.

#### *A Satisfactory System*

After the failure of these experiments, it was found advisable to appoint as an inspector of vital statistics one having a knowledge of various languages, who would visit each district and pick out the most suitable man as registrar, regardless of politics—generally the postmaster, the magistrate or justice of the peace; these appointments were made wherever there was a settlement, so that no excuse could be advanced that distance was a factor in non-registration. This system has worked satisfactorily in the rural districts, there being 780 of such registrars in the province, all reporting directly and receiving their commission and remuneration from the Department.

Wherever possible, use is made of civil servants, such as court clerks, police inspectors or municipal officials in their own town. The provincial police have been found very useful in remote districts. On Indian reserves the logical person has been found to be the Indian agent; or, if the agency is too large for his own personal supervision, it has been divided, and generally the resident clergyman or priest willingly accepts the appointment.

In summarizing the problem of registration in rural districts, I would suggest that the registration district be not too large; that the registrar be some public man with a convenient office; that all registrars be directly responsible to the central bureau; and that each district be visited regularly by an inspector of vital statistics.

#### BIRTHS

##### *Registration*

We all know how essential it is to have a complete record of every birth, not only as a legal record of a child's entry into the world but also from a statistical viewpoint, as several very important vital statistics tabulations and rates depend for accuracy upon complete

birth registration; and yet birth registration is probably the most difficult class of registration to obtain, and the one most neglected by the public.

The parties primarily responsible for registering and reporting births are the parents and the medical attendants, and these are the classes to which our efforts must mainly be directed. Educating the public and profession by various means has gone a long way towards securing a greater percentage of birth registration, but there is a small section who remain refractory and who ignore their duty towards the state, their child or their patient. There has always been a reluctance on part of vital statistics bureaux to prosecute for such an offence; why, I do not know. Is not the breaking of the law in this case a much more serious offence than the infringement of a traffic regulation? Yet the detection of a traffic infringement invariably is followed by prosecution. The Alberta Bureau frequently resorts to this means and with decidedly good results, especially if there is newspaper publication. A prosecution in a rural district is usually effective for a number of years and greatly assists the district registrar.

District registrars are, however, averse to laying information against offenders in their own district, which is quite understandable, as the offending person may be a friend of the registrar. It should, therefore, be the business of the department to detect and remedy individual breaches with as little involvement of the local registrar as possible. For instance, the reporting of births by doctors to district registrars is more honoured in the breach than the observance; if, however, the district registrar has instructions to pin the doctor's notification card to each registration when it is forwarded to the department, the department can then check those registrations that are minus the necessary notification, and act accordingly without involving the district registrar.

The checking up of church registers, as you are all aware, affords only partial results, and this type of investigation is rather obnoxious and, at best, a check only on the children who are baptised.

Advocating the possession of a child's birth certificate has always shown excellent results, apart from being a good financial move on the part of the Bureau. On the birth of a new Albertan, the parents receive a congratulatory pamphlet containing advice as to how "to start it off right" by procuring a certificate. The effect of this is shown in the number of birth certificates issued during 1930; namely, 11,747 out of a total of 17,569 births. The possession of these certificates has resulted in an increase in the recording of belated registrations, as the parents often request certificates for the older members of the family whose registration may have been neglected. These factors all help to remind and impress on the parent the necessity of registration when the next birth occurs.

I would suggest that, where possible, the provincial registrar or director of vital statistics should be also registrar of the city in which

his office is located. Apart from eliminating duplication in that city and curtailing expenditure, it gives the provincial registrar and his staff an insight into actual district registration work which they can seldom attain as a purely provincial organization not in touch with the public. By actual contact he is able to detect where the weak spots are and how to circumvent or improve them. This system has worked well in Edmonton. I have no brief, however, for stating that it is feasible in cities the size of Toronto or Montreal, or even in cities which bear the cost of their own registration work.

#### *Amendments to Registration Acts*

It was from the writer's own personal experience in city work that two sections were added several years ago, one to the Hospital Act, and the other to the Vital Statistic Act. The former is as follows:

"The board of every hospital shall, in respect of every child born in the hospital, cause a birth registration form to be filled out and signed by the mother of the child before she leaves the hospital and thereafter to be forwarded to the Registrar of Vital Statistics." The primary reason for this was the ridiculously small number of illegitimate births registered. Naturally the mother wished to avoid publicity, was averse to registration, frequently came from some other district, and generally disappeared immediately upon leaving the hospital, often with the assistance of the doctor or other parties concerned. This may have been all right from a sentimental viewpoint, but from the point of view of a registrar charged with the duty of recording facts, this leakage had to be stopped, and stopped it was, with the result that the illegitimate birth rate of the province of Alberta has increased.

The increase of the registration of illegitimate births was not the only result; it has meant also that 100 per cent of all the children born in hospitals or nursing homes have their births recorded.

The parents are allowed an extra month to visit the registrar's office if they wish to add or alter a Christian name, thus giving the registrar an added opportunity of disposing of a birth certificate.

The other innovation previously referred to was inserted in the Vital Statistics Act and is as follows:

"At the beginning of each school term, every teacher in charge of a school shall prepare a list of the children entering school for the first time, together with the places and dates of their birth, and shall forward the same to the Registrar General." Every registrar is aware that no matter how watertight his system of registration may appear to be, there is still a leakage of unregistered births. The problem, therefore, arose as to the best point at which to catch these births and impress upon the parents their negligence. When the child entered school at the age of six, was the earliest opportunity that presented itself, but it was too good an opportunity to miss, as practically every child that remained in the province could have its birth checked at that period.

The co-operation of the Department of Education was readily obtained as, by agreement, we notify that Department of cases where parents are falsifying the child's birth date so as to enable it to enter school earlier than the prescribed age. Parents of unregistered children are given the chance to make a delayed registration upon payment of the usual fees and purchase of a birth certificate to present to the Department of Education; otherwise, the child may be refused admittance to the school. In other words, the procedure necessitates a certain amount of trouble on the part of the parents so that they generally check any other births in the family and are prepared for the future. This clause of the Act entails extra work on the part of the Bureau but the results amply justify it. Not only are the unregistered births registered, but a great number of errors and mistakes in names and dates are detected during this survey.

Another means of securing publicity is to solicit the services of the various organizations in connection with your own health department; health inspectors, travelling clinics, and provincial nurses provide ideal means, and are ever ready to co-operate in the work of better birth registration. As a rule, these organizations are lecturing in various parts of the province. It is, therefore, advisable to write out for them a short lecture or series of lectures on vital statistics, which they may deliver as an appendix to their other lectures.

#### *Birth Registration and the Immigration Laws*

The most valuable publicity birth registration has had during these last two years came from a rather unexpected source; namely, the tightening of the immigration laws of the United States, where proof of place of birth has been vigorously demanded. Among unregistered persons the refusal of, or difficulty of entry to that country will certainly create a number of supporters of birth registration. I am informed that the United States immigration authorities investigated several such late registered births from Canada, and found several Central European born immigrants in possession of Canadian birth certificates. We must keep in view the fact that the genuineness of a birth registration may be of much more legal importance than even the means of entry into a foreign country, and I maintain that a birth should not be registered after five or six years unless there be submitted to the registrar sufficient proof that would stand a test in a law court. This is a matter that could well be discussed and some uniform system of delayed registration evolved for all provinces, a system that would inspire confidence in the truthfulness of all such records.

## DEATHS

#### *Registration*

The registration of deaths does not present the numerous difficulties to be met with in the registration of births. A death causes more

publicity than a birth, while the body usually has to pass under the purview of a doctor or undertaker, a clergyman and a cemetery caretaker. In spite of all this, however, unless the department is constantly on the alert, a death may remain unregistered; for instance, one occurring in some remote district, or buried on a coroner's warrant, or after a police investigation, or shipped out of the province by a transportation company.

The first essential in keeping a close check on deaths is for the department to have some statutory check on the cemeteries. Fourteen years ago the following section was included in the Alberta Vital Statistics Act: "Every caretaker, superintendent, owner, clergyman, minister or other person in charge of any cemetery, shall on or before the last day of March, June, September and December in each year, transmit to the Department a return showing the number of burials therein during the preceding three months, giving the names of the persons whose bodies are therein buried and the date on which interment took place." Listing all the cemeteries and places of burial in a huge unpopulated area was quite a lengthy task, as there is a burial ground in every community. This was accomplished mainly by writing to every municipal secretary-treasurer, every registrar, postmaster, and clergyman in the province. The astounding number of nearly 1,000 recognized burial grounds was received.

#### *Unregistered Deaths*

The next task was fixing ownership of many of these loose-end cemeteries and compelling the authorities to appoint some definite person as a caretaker who would be responsible for sending in the quarterly reports. This work was not easy, and was accomplished in many cases only by threats of closing up the cemetery. Numerous prosecutions had to be made for failure to comply with the Act or for neglect to enter a burial on the register (this is now looked upon as an unpardonable offence), but gradually the whole system began to function smoothly, and now the reports from cemeteries are as regular as the reports from registrars. Practically the only leakage in the complete return of all burials occurred in the foreign and remote settlements where bodies were buried on farms or homesteads. This is a pernicious system and should be vetoed on every occasion, as such interments may be made to cover up a crime. In Alberta, and I presume in most of the other provinces, there is no act which actually forbids such burials. The Alberta Bureau of Vital Statistics, however, devised a scheme which practically put a stop to this practice. It was maintained that if a body was buried on a homestead, the place of interment became a burial ground, within the meaning of the Act, and as such, the owner was the caretaker and therefore had to report to the Department at the end of each quarter, whether further burials took place or not, as the Bureau requires a "Nil" form if no interments

are made. This business of compulsory reporting four times a year became irksome, with the result that indiscriminate burial has practically ceased, and hundreds of bodies have been disinterred and placed in recognized cemeteries. Needless to say, the Department staff checks up closely every cemetery record with the Death Index Books, and I feel assured that with such a system very little escapes notice.

The few unregistered deaths that have been detected by the Department are, strange to say, those which have been investigated by a coroner. In Alberta, and probably in some of the other provinces, the coroners issue a useless form called "A Warrant for Burial" and although the Act states that this form must not be issued until the death is properly registered, the coroner often goes ahead, and forgetting registration or intending to do it later, hands his form to an undertaker or cemetery caretaker who probably presumes that the death has been registered. This omission is, of course, detected by the Department when checking the cemetery returns, but as a further check, the Bureau has an arrangement with the Attorney General's Department to forward all coroners' returns for scrutiny, as I believe it is profitable to make use of the returns of any other department that may be of value. I would recommend that every department of vital statistics, where similar trouble is experienced with coroners, agitate for a change regarding the "Warrant for Burial." The correct form to use and one which would entail no alteration in the routine or duty of the coroner would be one entitled "Coroner's Warrant for Registration of a Death," the burial permit being issued in the usual way by the district registrar.

#### *Sudden and Violent Deaths*

Sudden and violent deaths, drownings, suicides, accidents, etc., often present a problem to the Bureau, as in many cases the deceased is a transient or without friends or relatives who can give any personal information whatever. The body may be disposed of or buried in the bush far from a registrar, and the chances are favourable for no record ever being made. Such cases, however, are usually investigated by the police, who generally have a complete history of the circumstances surrounding the death and all the possible available information regarding the deceased. A vital statistics bureau should, therefore, make arrangements with all police forces in the province, both city and provincial, to make an extra copy of each report and forward it to the central bureau. Every morning these reports are received in the Alberta office from all over the province, and have been of great assistance. It was also found advisable to attach these reports to the back of the registration as a permanent record, as many of these unusual deaths were of missing persons whose relatives resided outside the province or in other countries, and who did not hear of the death until months

or even years had elapsed. These records are, therefore, invaluable for purposes of identification and complete information.

#### *Presumed Deaths*

And while on this subject it might be in order to mention the problem of presumed deaths; that is, deaths that are known to have occurred but where the body has not been found. I am informed that legally a death should not be registered until the body has been recovered, or an order presuming death is received from the Court. From past experience we are aware that numerous bodies have not been and never will be recovered, and no order will ever be issued by the Court, unless perhaps the deceased had an estate in which his relatives are interested. The police reports contain many cases reporting deaths by drowning, where the facts are indisputable and where the body will not be found. Our Bureau has, therefore, a separate register of Presumed Deaths containing such entries. These registrations are not considered strictly legal and certificates are not issued for them unless a judge's order is received presuming the death, on receipt of which the registration is transferred to the ordinary death records.

It has been found much easier to register these presumed deaths in the separate register at the time of supposed death, than to collect the information months or years afterwards, when it is practically not available. I am interested to know what other provinces are doing in this connection, and if a uniform procedure could be devised.

## MARRIAGES

#### *Marriage Registration*

In my opinion marriage registration has never been given its proper value in vital statistics. Marriage, it is sometimes declared, is a greater event in a person's life than his birth or death. It is the foundation of a new home, the place where children are born, the cradle of the future nation; and should, therefore, have a claim for vital statistics attention equal to the other two main statistical events.

One hundred per cent registration of marriages should present no serious obstacle, provided the bureau of vital statistics controls the whole machinery pertaining to marriage. That means the administration of the Marriage Act, the granting of authority by certificate to clergymen, the custody and issuing of all marriage licences, receiving of the fees for same, the appointment of marriage licence issuers, and the supervision of banns. The Alberta bureau has been doing this work for the past eleven years. Previous to that time, the marriage system was chaotic, owing to another department's issuing the licences and caring little about legal technicalities or registration, the interest being centred mainly on the collection of fees. No such division of work is possible with efficiency.

*Continuity in Operation*

If a department of vital statistics is charged with the duty of securing registrations, it is only logical that there should be complete continuity in the whole operation. Every marriage licence that is issued by the government and every bann that is called should be followed up, and if the corresponding registration of marriage is not forthcoming within the statutory time, enquiries should be made. This obviously should be done by only one department, and, moreover, the vital statistics department has practically all the machinery at hand for efficiently undertaking the work. Who but the district registrars should be marriage licence issuers? Certainly not the jewellers, who are generally more interested in the amount of jewellery they can dispose of than in the legal qualifications of the persons concerned. It is just as logical for the butcher to sell dog licences as for the jeweller to handle marriage licences. The district registrar who is also licence issuer, has, like the Department, a continuity of interest in the proceedings; he issues the licence and expects to receive the registration, or is able to advise the Department or the clergyman of its failure to appear.

*Departmental Revenue*

There are many more arguments that could be advanced in favour of the Bureau of Vital Statistics controlling the whole marriage system, but the length of this paper will not permit me to linger on the subject. There is one aspect, however, that I would like to present before leaving the subject of marriage. It may sound rather mercenary in a paper of this kind: it is the subject of fees or revenue. We have doubtless all experienced the struggle to obtain a sufficient appropriation to carry on the work of the department, even fighting sometimes to prevent our estimates being cut, and how we have had to take our medicine, feeling that we were beggars at the door of the Treasury Department! What a different outlook we would have if we could only make our department self-sustaining and even turn in a surplus to the treasury. Our self respect would increase and our demands for adequate funds would receive more consideration. These are facts, as the Alberta Bureau has been self-sustaining since 1923 and turned in a surplus to the treasury last year of \$15,000.

Similar results can be attained by every other province, provided the various bureaux are given power to administer the Marriage Act and issue licences, and this is worth struggling for. As previously stated, the revenue from certificates of birth is considerable, as is also that from certificates of marriage, the bride being circularised by the department on receipt of the registration, and often thanking the department for giving her the opportunity of procuring such a valuable document.

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# Isolation of the Colon Group in Water\*

NORMAN J. HOWARD

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IT is of particular interest at this meeting to recall the fact that it was a Canadian who first suggested the adoption of more uniform and efficient methods for the examination of water supplies. At the 1894 meeting of the American Public Health Association, Dr. Wyatt Johnston of Montreal outlined his views on the subject; views which took several years to materialize. Some 11 years later, at the Havana meeting in 1905, the first edition of Standard Methods was presented to the Laboratory Section of the Association. This report was adopted and printed in Chicago the same year. In America, one of the earliest workers on the colon group was Theobald Smith who in 1895 described the characteristics which he considered true to this species, and his standards were largely adopted by American bacteriologists. Prior to 1900, comparatively little systematic work on the isolation of the colon group in water had been carried out in America, but in Europe—notably in England, France and Germany—a test was being generally employed. In 1904 the English Committee appointed to consider standard methods defined the characters of *B. coli*. In the subsequent years, while many changes have been made in the primary and secondary media employed, the *B. coli* test has survived all vicissitudes, and remains the most practical and reliable method not only for determining the final safety of water but also for judging the efficiency of the various treatments and sterilization processes commonly used.

## *Methods Introduced During the Past Thirty Years*

The earliest primary method involved the use of dextrose broth and dextrose liver broth. Later dextrose and lactose broth was used, and in 1912 the use of lactose bile was adopted in Standard Methods. The first objection to the use of both dextrose broth and lactose broth was the difficulty experienced in recovering organisms of the colon group, particularly in heavily polluted water. As yet this objection has not been overcome in the use of standard methods and, as a result, the addition of certain inhibitory salts and of triphenylmethane dyes have been investigated. Those who oppose the use of these claim that inhibition in any form is objectionable in that it possibly creates a greater error than may occur with the use of plain lactose broth. In the light of a personal experience of more than 20 years, and supported

\*Presented at the Canadian Public Health Association, Section of Public Health Engineering, 20th Annual Meeting, Regina, June, 1931.

by the views of many, the writer is not prepared to accept this view without reserve, because in the majority of cases it cannot be supported by facts. It is true that the composition of waters varies greatly and so different waters react differently with various media. It is also true, however, that a contaminated water capable of causing water-borne disease, will yield positive tests in almost all media, whereas attenuated forms of the colon group, which cannot be regarded as of the same sanitary significance, may fail to cause fermentation of media containing inhibitory substances. The crux of the whole situation lies in an intelligent interpretation of the results, based upon a knowledge of the water under examination.

We have to consider in discussing this subject the value of the following:

1. The use of lactose broth according to standard practice, involving presumptive positive tests many of which are not "confirmed."
2. The use of lactose broth plus the addition of inhibitory salts and triphenylmethane dyes, which may yield fewer primary fermenters but a greater percentage of "confirmed" tests.
3. The introduction of buffer salts in the presumptive media which reduces the production of lethal acidity and results in an increased number of "confirmed" tests.
4. The use of solid media which is said to differentiate the fecal and non-fecal types of the colon group.

The use of lactose broth as a primary medium is world wide, regardless of the fact that there occur a considerable number of fermenters which fail to "confirm" or even to grow on a secondary medium. Unless the water is heavily polluted, fermenters which fail to "confirm" are usually confined to cultures of 48 hours' incubation. Such findings, also, may be due to the presence of spore-forming organisms exhibiting symbiosis. The inability to recover organisms of the *B. coli* group from lactose broth is largely due to overgrowth or to the production of lethal acidity which has resulted in the death of these organisms. This explanation is generally accepted and is the subject of little contention. In an effort to overcome these conditions, MacConkey and Hill (England) as early as 1901 suggested the use of bile salts (sodium taurocholate, now commonly called sodium tauroglycocholate) in amounts up to 0.5 per cent. This practice is still in general use abroad. In 1912, Standard Methods of the American Public Health Association, based largely upon the work of Jackson and his associates, recommended the use of undiluted fresh oxgall plus 1 per cent peptone and 1 per cent lactose. The recommendation of this medium was questionable, as sufficient experimental work had not been undertaken throughout the country, and in the subsequent edition of Standard Methods, published in 1917, lactose bile was abandoned. The result of the use of this medium in such heavy concentration caused a reaction against the use of bile salts in America, a prejudice which still exists.

In recent years, possibly more research work has been carried out

on the use of brilliant green bile broth than on any other medium, the original work having been undertaken by Muer and Harris in 1920. Later researches were made by Winslow and Dolloff, Hale, Levine, Howard and Thompson, and Dunham, McCrady and Jordan. During a 10-year period, fairly uniform results were reported by these workers. In almost all cases lactose broth was found to give a slightly higher number of "confirmed" tests but the percentage recovery from brilliant green bile far exceeded that of lactose broth. In progressive stages the composition of the medium has been modified until at the present time the bile salt has been reduced to 2 per cent, while the brilliant green concentration has been lowered to 1 in 75,000. The Toronto work carried out in 1925 by Howard and Thompson, showed that when lactose broth was used as a presumptive medium, brilliant green bile could be safely employed as a confirmatory test, the results being rapid and reliable and eliminating much unnecessary confirmatory work. Further conclusive studies made by McCrady, followed by those of Jordan and his associate members of the American Water Works Association, have suggested the use of brilliant green bile broth in conjunction with lactose broth as a primary test, the confirmation being dependent upon the initial fermentation of both mediums. The proposed 7th edition of Standard Methods at present in preparation, allows the use of brilliant green bile broth only in plant control and not on "finished" water. Amongst other media suggested was the gentian violet broth of Hall and Ellefson (1919). They found that the addition of 1 in 100,000 of the dye to lactose broth, inhibited over 94 per cent of spurious types of *B. coli*. More recently, Dominick-Lauter broth has received considerable attention. This medium consists of lactose broth together with dipotassium phosphate and the addition of 1 in 6,666 of methylene blue, with 1 in 32,000 alcoholic solution of brom-cresol purple. The use of this medium is said to have eliminated symbiotic lactose-splitting combinations and other spore formers, and not to need confirmation on a solid medium. The buffered medium produces a more favourable environment for the direct cultivation of the colon group. The investigating committee of the American Public Health Association recently reported that, of the total number of samples showing a positive presumptive test, 100 per cent were confirmed by this medium, whereas only 68.7 per cent were confirmed for standard lactose broth, the Dominick-Lauter medium being far superior to lactose broth for the detection of *B. coli* in water.

The use of a buffered medium would seem to be the most logical for the colon test, if objections to the use of inhibitory reagents are considered justified. In 1915, Clark made some of the earliest tests on a buffered medium. These were followed by other workers, notably Cohen and Clark (1919), Thompson (Toronto, 1927), Salle (1927), Butterfield, Norton and Barnes (1929) and recently Ruchhoff, Kallas and Chinn (1930) made further exhaustive studies in Chicago. Thompson pointed out that while it is generally known that *B. coli* is inhibited

by the formation of acidity in carbohydrate-containing medium, this fact does not seem to have been seriously considered as a factor in the failure of presumptive tests to confirm, and further that the production of a lethal H-ion concentration may be largely eliminated by increasing the buffering capacity of the presumptive medium by the addition of dipotassium phosphate. The work of Ruchhoft and co-workers previously mentioned, showed that the addition of 0.2 per cent dipotassium phosphate as the buffer in broth with an initial adjustment of 7.0 to 7.2 produces a final average pH of 5.6 compared to 4.75 in standard lactose broth (using *B. coli* strains). Buffering increases the bacterial growth rates and also the amount of gas produced both in lactose broth and brilliant green bile broth.

In considering the use of solid media for differentiating the fecal and non-fecal types, many formulae have been tried and in a majority of cases have not been found to be consistently satisfactory. The eosin-methylene blue agar as suggested by Levine is still extensively used. Special mention, however, should be made of the work of Tonney, Noble and Greer at Chicago, on the direct count of colon-aerogenes organisms on a solid medium. This was first described by Noble who designated it as cyanide-citrate agar. In this medium, the colon-aerogenes group can be differentiated and the number estimated, and inasmuch as the authors have shown that in normal human feces the ratio of *B. coli* is in excess of 95 to 1 and in soils and vegetation, etc., a converse ratio of about 1 to 20 was obtained, the value of the medium is apparent. Great additional value would be attached to the *B. coli* test, if this medium is developed sufficiently and differentiation is made possible between fecal and non-fecal types of the colon-aerogenes group.

From the foregoing it is obvious that some action must be taken in the near future to improve the presumptive test for the isolation of the colon group in water. The present methods would seem to be out of date and inaccurate, and yet until standard methods, which at least in the United States are held valid in court, are altered, the present methods will be largely employed. The question of varying types of water requiring different media for the presumptive test, again raises a difficult question if standard methods are to be used. In many instances the water of nearby cities having different sources of supply have been found to give inconsistent results, when using a similar primary medium. To secure accurate results therefore it is necessary to determine the composition and reaction of each medium suitable for the type of water involved, but if this is done, the standardization of methods must necessarily suffer.

For the time being the subject in general must remain a contentious one and research work throughout Canada is urgently needed. The results of such research may provide a sufficient basis upon which optional standards of bacteriological analysis can be defined. The city of Toronto has carried out pioneer work in laboratory research in the field of water purification, and at all times is willing to assist and co-operate with others having a common object in view.

# Vapour Baths in the Trans-Canada Highway Camps

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**D**ESPITE the fact that there are to this day an astonishingly large number of human beings who have never suffered the indignity of having their entire cutaneous surface exposed to the beneficial effects of soap and water at one time, unless by accident, the luxuriousness of engaging in a warm or hot bath has long been known and has been enjoyed by many people throughout the ages.

The beginnings of bathing are lost in remote antiquity. There is evidence to indicate that the principle of bathing was not of independent origin but was known among savages, or races in an early stage of civilization, as exemplified by the hot air boxes or ovens of the Mexican natives and South Americans, the crude holes in the earth of the Finns, the "medicinal sweats" of the American Indians, the small baths of the ancient inhabitants of Scotland and Ireland and the larger vapour baths of Japan, Russia and Turkey. In Greece and Rome the baths reached very elaborate proportions. The great physician Galen approved of the following order in bathing. After undressing in the vestiarium, the bather proceeded to a hot air bath in the laconicum, or sweating room, and thence to a hot water bath in the calidarium. This was followed by a cold bath in the frigidarium and a thorough massage. Other physicians of the time recommended similar but more extended procedures.

The opinion prevailed in ancient times that purification of the body symbolized moral purity. Thus we find that in Egypt the bath was a religious rite. Among the early Hebrews it was not only one of the first purificative duties but it was positively prescribed by the Mosaic law in certain specified cases of uncleanness. In Turkey, Islam enjoined on the believer the careful preservation of corporal purity, and for this purpose prescribed repeated daily ablutions. This worthy belief, which is most heartily recommended, continues today in the modern text that cleanliness is next to godliness.

The vapour baths used in many of the construction camps of the Trans-Canada Highway are of Russian or Scandinavian origin and are particularly adapted to cold countries, where they have been found a necessity for many years. On the north shore of Lake Superior are to be found several of these baths. The bath house is a structure about 20 ft. square and 7 ft. high, usually built of rough logs chinked with moss or clay and one end partitioned off to be used as a dressing room. Around the wall is a bench on which the bathers may sit or recline.

In the corner of the room and sometimes below the level of the floor has been built a heap of stones in such a manner that a fire may be made under them.

A hot fire is kept burning under the pebbles all day long. When the hour for bathing has arrived the fire is pulled out and the naked bathers seat themselves on the benches. Cold water is thrown on the hot stones which causes clouds of dense vapour to form and completely envelop them, the density being controlled by the amount of water used. This vapour produces profuse perspiration and by its action the scurf becomes softened and loosened and may be easily removed by simple rubbing.

The vapour bath acts upon the body much as the hot water bath does but it acts more powerfully, though the effect of the heat is not so rapid, since vapour is a poorer conductor of heat than water. This bath can, therefore, be borne much hotter than a hot water bath, but the high temperature cannot be borne longer than 10 or 15 minutes, for the vapour does not permit of the loss of heat from the body as the air does. The temperature of the vapour bath cannot be comfortably endured above 120° F. and the fact that it is inhaled makes it still more oppressive. The bath can be borne for a much longer time if the vapour is not inhaled.

After the bathers have sweated for some time, and from time to time cooled themselves again by having cold water poured over them, the skin is rubbed with soap. On coming out of the sweating room the hardier bathers roll in the snow or immerse themselves in an outdoor pool. The others are content to vigorously switch their bodies with bundles of cedar twigs dipped in cold water. After the first reaction the blood returns to the skin and a pleasant glowing sensation spreads rapidly over the surface.

These baths have proved to be very popular in the camps. They are stimulating and induce not only a pleasant feeling of warmth but also of vigour.

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21ST ANNUAL MEETING  
CANADIAN PUBLIC HEALTH ASSOCIATION

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16TH ANNUAL MEETING  
ONTARIO HEALTH OFFICERS' ASSOCIATION

MAY 25, 26, 27, 1932

ROYAL YORK HOTEL, TORONTO

# Editorials

DOCTOR PETER H. BRYCE

THE death of Doctor Peter H. Bryce on January 15, 1932, brought to a close the career of one who for half a century was one of the outstanding figures in public health in the Dominion of Canada.

Peter Henderson Bryce was born at Mount Pleasant, Brant County, Ontario, on August 17, 1853. He received his preliminary education at Upper Canada College. He graduated from the University of Toronto with the degree of B.A. in 1876. He subsequently obtained the degrees of M.A., 1877, M.B., 1880, M.D., 1886. For a brief period after graduation he practised his profession, first in Toronto and then in Guelph. For a time he served as Professor of Chemistry at the Ontario Agricultural College. His great opportunity, however, came in 1879 when a select committee of the legislature of the Province of Ontario was appointed to consider the question of creating a public health organization for that province. As a result of the deliberations of this committee the Prime Minister of the province, at that time, Oliver Mowat, introduced legislation creating the Provincial Board of Health of Ontario. This step was taken in 1882. Doctor Bryce was made first Secretary of the Board. He continued to occupy that post until 1904 when he was appointed Chief Medical Officer in the Department of Immigration of the Dominion of Canada. There he remained until his retirement in 1921.

Of Doctor Bryce it can be truly said that he was a pioneer in the finest sense of the term. The Public Health Act of Ontario was model legislation. It was enacted at a time when there was little in the way of precedent for the guidance of those who were laying the foundations of public health in this Dominion. This legislation was the first public health act passed by any legislative body in Canada. The passage of the Act created the Provincial Board of Health as has been indicated. This, however, under Doctor Bryce's guidance, was amended by the Public Health Act of 1884 in which provision was made for the appointment of seven members and an executive officer who, at the time, was designated Secretary of the Board. At a later time (1887) another amendment provided that the executive officer should be known as the Chief Officer of Health as well as Secretary of the Provincial Board of Health. The clarity of vision which characterized Doctor Bryce and his early associates in public health will best be understood when the functions of the Board, as set out in the Public Health Act, are recalled. These were:

1. The collection of sanitary information

2. The dissemination of sanitary information
3. The promotion of public health legislation
4. The investigation into causes of diseases
5. The control of outbreaks of communicable diseases
6. The control of water supplies and certain foods, especially milk
7. The promotion of social hygiene
8. The supervision of sanitary conditions in public institutions

When it is realized that the time was 1884 and that the English Public Health Act had been passed only twelve years previously, it will be appreciated how well informed Doctor Bryce and his group were. The legislature of the time was, of course, unable to provide more than very modest appropriations for public health work, so that, at the outset, the activities of the Board were really limited to efforts to control outbreaks of disease, especially small-pox, to the abatement of nuisances and to recommendations relating to the installation of communal systems for public water supplies, sewage disposal plants, etc. Perusal of the early reports of the Provincial Board of Health makes clear that this act provided that all municipalities of the Province of Ontario were to establish local boards of health. These communities were assisted in their efforts to improve local sanitary conditions by the Provincial Board of Health. In this connection it may be interesting to recall that in 1882 there were only twelve municipalities, cities, towns, etc., in a total of nearly six hundred, in which provision had been made for systems of public water supply; in seven there were sewerage systems. By 1901 one hundred and ten municipalities had established public water supply systems and forty-eight had developed plans for sewage disposal.

From time to time during his tenure of office the character of the Public Health Act was modified and improved by various amendments thereto. These statutory changes made provision whereby municipalities might appropriate land for sites for isolation hospitals; might demand inspection of dairies, abattoirs, etc.; gave authority to municipalities to supervise milk and meat supplies offered for sale; declared that plans for the installation of municipal systems of water supply or sewerage must first be approved by the Provincial Board of Health before the work was undertaken; provided for the licensure and inspection of sources of meat and milk supplies, for the supervisions of sanitary conditions in unorganized territory, for the investigation of cases of communicable diseases and finally, in 1890, for the creation of the first Provincial Diagnostic Laboratory in North America.

These were no mean achievements in pioneer days, in a sparsely settled province of vast distances and limited financial resources. Vision, courage and resourcefulness were essential in those entrusted with the guidance and direction of public affairs. This was especially true in the domain of public health. Fortunate indeed it was that in

Doctor Bryce the Province of Ontario had a public servant imbued with a high sense of his responsibilities and an intelligent understanding of his opportunities. In these early days Doctor Bryce was the sole member of the provincial public health organization employed upon what is now known as a whole-time basis. It is true, however, that he had as collaborators a group of well trained, public spirited, capable members of the medical profession who were also deeply interested in the promotion of public health. It is very greatly to the credit of the early members of that profession in the Province of Ontario that many of their number gave so unselfishly of their time, energy and abilities to assist in such undertakings when preventive medicine was so little understood or appreciated here or elsewhere.

Upon his retirement from the post of Chief Medical Officer of the Provincial Board of Health of Ontario in 1904, Doctor Bryce became Chief Medical Officer of the Department of the Interior as aforesaid. The duties of his new office were related to medical problems arising out of the immigration of hundreds of thousands of new citizens arriving in Canada from almost all parts of Europe. Here again he pioneered and set about laying the foundation of a new type of medical service in this country.

In addition to his activities in his own profession Doctor Bryce was active in the literary field. He was long a member of the Canadian Historical Society. Several volumes, some scientific and others literary, were produced by him and only recently he is said to have completed a biography of Sir Oliver Mowat. He was a member of many scientific and literary societies and in 1900 was elected President of the American Public Health Association and he was the first Canadian to hold that office. He was elected to honorary life membership in the Canadian Public Health Association in 1924. For many years he was President of the Arts and Letters Club of Ottawa of which organization he was one of the early members and always a staunch supporter.

Doctor Bryce was a man of delightful personality, cultured and well informed. He was for many years one of the best known figures at all medical and public health gatherings held in Canada. Many of his friends were delighted to see him, apparently in excellent health, at the time of the Montreal meeting of the American Public Health Association in September last. He was full of plans up until the end. Less than a week before his death the writer received a letter from Doctor Bryce in which plans were outlined for collaboration in the preparation of a publication which was to deal with the development and progress of public health in Ontario during the past half century. He died while en route to the West Indies where he had gone for a few weeks before commencing work, details of which he had already formulated. The early reports of the Provincial Board of Health of Ontario, which were prepared by Doctor Bryce, will always constitute one of the finest and most enduring memorials of his industry and zeal.

on behalf of public health in the Province of Ontario. These little known and little read volumes, are truly a very real source of information for the student of public health.

Doctor Bryce is survived by three sons, Rev. George P. Bryce, a United Church missionary at the College at Mhow, Central India, Peter I. Bryce of Vineland, Ontario, and W. F. M. Bryce of Ottawa; two daughters, Mrs. C. C. Robinson of Nagoya, Japan, and Miss Eleanor Bryce of Ottawa; several grandchildren, and two brothers, Doctor John Bryce of Erie, Penn., and Alexander Bryce of Colborne, Ont. To members of his family the Canadian Public Health Association at this time extends sympathy in their bereavement.

*J. G. Fitzgerald.*

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#### THE COMING ANNUAL MEETING: AN URGENT NECESSITY

**W**HAT is to be the effect of the present economic depression on the state of the public health? Will the lowered standards of living, with consequent slackening in personal hygiene and the inability to provide proper sanitary environment in the home and municipality, result in an increase in the deaths from diarrhoea and enteritis—one of the main problems of infancy. Will the reduced budgets of the public health departments and of the family mean less immunization against diphtheria, our greatest problem of the pre-school child, with the inevitable result of children dying because of the lack of this protection? Will the stress of the period and, in some cases, actual deprivation of necessities mean an increase in our tuberculosis deaths, probably our greatest public health problem?

These questions, all important and all probably to be answered in the affirmative, indicate some of the acute problems with which the medical officer of health is faced. At no time in the history of the Association has there been a more urgent necessity for frank statement of the problems and free discussion of methods of meeting them, for pooling and analyzing our accumulated knowledge and experience and demonstrating over a wide field the lessons that lie therein. In order that full advantage may be gained from the Annual Meeting of the Association with that of the Ontario Health Officers in May, very special effort should be made to have a large attendance. There must at least be no slackening in our desire and our effort to learn—and the Annual Meeting is the medium through which information is most accessible.

Our national conference becomes not a matter of convention, but of necessity.

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## LABORATORY SECTION

G. B. REED, PH.D. AND A. L. McNABB, D.V.Sc.

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### *Preparation of Colloidal Gold Solution*

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**R**EPORTS indicate that many laboratories experience considerable difficulty in the manufacture of a colloidal gold reagent suitable for the testing of cerebro-spinal fluid. In fact, some have been known to have encountered so much trouble that they were compelled to discard the test owing to inability to prepare an adequate supply of the proper reagent.

As in the experiences of many others, our early efforts to prepare this test solution were attended with only partial success. For the first few years we used the Miller Method<sup>1</sup>, and, as a rule, every time the product was manufactured five or six separate lots, each of one litre, were made. Although care was exercised to follow closely the prescribed procedure, nevertheless about one-half of the lots so prepared were rejected on account of failure to conform with the standard requirements when tested with known positive and negative spinal fluids. Despite some attempts to determine the variables which were responsible, we failed to clear up the difficulty, and consequently it was decided to find, if possible, a method of preparation that would give more consistent results. After a review of various published procedures, it was decided to try that of Mellanby and

Anwyl - Davies, as described by Haden<sup>2</sup>. Kilduffe and Hersohn<sup>3</sup> elsewhere give a very similar description of the method.

Preliminary work soon indicated, however, that, owing to our particular conditions, some slight modification of the Haden procedure would be necessary. Accordingly, certain changes were made, and, as a result, we found it possible to prepare consistently satisfactory solutions in individual amounts of 800 mils, although Kilduff and Hersohn draw attention to their inability to manufacture it in larger batches than 100 mils at one reduction. For the past four years all of the colloidal gold reagent required in our laboratories has been manufactured by this modified method, and until recently each lot so prepared was of 800 mils volume. However, owing to a greater demand for the product the amount of the individual batch was increased to 1200 mils. This increase was accomplished without difficulty.

Details of the reagents, equipment and general procedure of preparation are given herewith:

#### *Reagents Required*

(1) Doubly distilled water.

Ordinary tap water is placed in a

clean copper still and the middle distillate is collected and reserved for a second distillation which is carried out on the day that the colloidal gold solution is to be prepared. In this latter distillation an all-glass Pyrex still is used.

(2) Gold chloride solution.

Gold chloride (Johnson and Sons, England), 5 grams.

Doubly distilled water, 500 mils.

(3) Potassium hydroxide solution.

Potassium hydroxide (J. T. Baker's purified by alcohol), 5 grams.

Doubly distilled water, 500 mils.

(4) Potassium oxalate solution.

Potassium oxalate, C.P. (Baker and Adamson), 5 grams.

Doubly distilled water, 500 mils.

All three solutions are stored in glass-stoppered bottles.

#### *Equipment Required*

In addition to the stills already referred to, the following equipment is kept in reserve in our laboratory solely for use in the preparation of colloidal gold reagent: Pyrex beakers, 2000 mils; 2 measuring cylinders, 100 and 1000 mils; 3 pipettes graduated in tenths, one 10 and two 25 mils; also a test tube, clock glasses, No. 4 Meker burner, tripod 9.25 inches high, and plain wire gauze.

#### *Cleaning of Glassware*

Just prior to using, the beakers, pipettes and measuring cylinders are washed with soap and hot water, followed by a rinse with concentrated hydrochloric acid. The acid is then removed by thorough washing with hot tap-water, after which they are rinsed twice with ordinary distilled water and then once with doubly dis-

tilled. Finally, they are rinsed with ethyl alcohol, and after draining they are ready for use. A further rinse with ethyl ether may be made, but this is not essential.

#### *Preparation of the Solution*

1200 mils of the freshly prepared, doubly distilled water is measured into a two-litre Pyrex beaker and 15 mils of the one per cent potassium oxalate reagent is added. The beaker is then placed in a piece of plain wire gauze on the tripod and heated with gas, using the No. 4 Meker burner turned on full. While waiting for the mixture to heat, sufficient of the alkali-gold chloride may be prepared to suffice for the needs of all the colloidal gold solution to be manufactured that day. This is made as follows:

One per cent gold chloride solution,  
50 mils.

One per cent potassium hydroxide  
solution, 15 mils.

Mix thoroughly, transfer 15.6 mils to the test tube by means of a pipette and set aside. When the mixture of water and potassium oxalate has reached an incipient boiling stage in which several bubbles are rising at one time from the bottom of the beaker, the contents of the test tube are added in one volume. Better results have been obtained by the addition of the alkali-gold chloride in this manner than by the dropping procedure recommended by Haden. As soon as a definite reddish colour has developed, the flame is reduced to about one-half, and when this red colour has deepened to a ruby shade the flame is removed entirely and the beaker covered with a clock glass.

Invariably at this stage the solution lightens in colour. The noting of the colour changes is important, since one must depend upon them for guidance as to when the heating should be reduced or discontinued. For this reason it is advisable to conduct the reduction near a window so that, by looking through the solution towards the light, the changes of colour are most easily detected. The covered beaker, from which the flame has been removed, is allowed to remain undisturbed on the gauze for about five minutes, after which it is removed to a dark cupboard. When cool the contents of the beaker are transferred to a Pyrex glass-stoppered bottle, and on the following day the product may be tested with known positive and negative spinal fluids.

In the preparation of the one per cent gold chloride reagent, Haden, like Kilduffe and Hersohn, advises its titration with the one per cent potassium hydroxide solution to ascertain the amount required in the making of the alkali-gold chloride reagent. He also recommends that the reaction of the finished colloidal gold solution be determined, and he describes a means of correction for cases where a solution is found to be either too acid or too alkaline. Our experience would indicate that by always using the brand of chemical that has proved to be satisfactory and by exercising due care to eliminate variable conditions in the manufacturing procedure, in so far as this can be done, these extra tests become unnecessary since the required amount of potassium hydroxide solution, once determined, will remain constant and the finished

colloidal gold reagent will be consistently satisfactory in reaction.

During the past eleven months, by means of the foregoing method, we have manufactured 128 litres of colloidal gold solution, all of which conformed with the recognized requirements, namely, giving a typical paretic curve with a known paretic fluid and also not producing a greater than number one reaction with a known normal spinal fluid.

In order to prepare satisfactory batches consecutively from the method just described, it is essential to standardize the various steps of the procedure and to adhere to them closely. The following are the chief details requiring attention:

(1) Reservation of the equipment used in the preparation of colloidal gold exclusively for this purpose, and the equipment, when used, to be in a proper condition with respect to cleanliness.

(2) Exercise of care to be assured of the following:

- (a) That the three solution reagents be of constant strength and always prepared from the same quality and brand of chemicals.
- (b) That the distilled water be the product of a double distillation and as free as possible from vapour-carried mineral salts.
- (c) That the heating as well as other steps of the reduction procedure be carried out as uniformly as possible.

#### REFERENCES

- <sup>1</sup>Miller, Brush, Hammers and Felton—*Bulletin Johns Hopkins Hosp.*, 1915, 26, 391.
- <sup>2</sup>Haden, R. L.—*Journ. Lab. and Clin. Med.*, Jan. 1925, X, 4, 310.
- <sup>3</sup>Kilduffe and Hersohn—*Jour. Lab. and Clin. Med.*, May 1927, XII, 8, 810.

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# PUBLIC HEALTH NURSING

RUBY M. SIMPSON, Reg.N., and MRS. GEORGE HANNA.

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## *Projects in Relation to School Health Work*

ELIZABETH SMITH, B.A., Reg. N.,

*Normal School, Moose Jaw, Saskatchewan.*

HERE are many different interpretations given by the term "project" as used in connection with classroom activities. Whatever may be the meaning of the term to each teacher, a project of necessity must be a class activity or unit of work, which has been introduced by the children, and the development of which is largely in the children's hands.

A health project, to warrant its existence, must be interesting and worth while. In order to realize this, it should be within the experience of the child and should meet a definite health need. Young children are interested in making things. As the child grows older he becomes more interested in the why and how of things, and projects requiring a certain amount of research may be undertaken. In such problems or projects, the constructive work most frequently follows the thought work.

The idea of the health project may develop from classroom discussions and situations, or problems developing out of the school environment. A dangerous street crossing in the neighbourhood of the school presents for solution a safety problem. Class discussions followed by a dramatization of the situation will set the stage for

a safety project in which the pupils work out their ideas of a solution to the problem.

In intermediate grades, pupils are studying the geography of their own country and other countries. They learn how people travel between countries, what products are exchanged, and how these goods are transported. They are interested in taking imaginary voyages to some of these countries. From this may develop a discussion of the ships and looking up pictures of the lake boats and ocean liners. This to one class presented the possibility of correlating health with geography. Why not make a ship? Why not make a Ship of Health?

When completed the project presented a little "Ship of Cleanliness." The main part of the ship was carved from a long bar of castile soap. Small tubes of tooth paste made quite realistic smoke stacks. From tooth brush masts were strung the dental floss wireless antennae. The derricks, which the pupils had discovered were used for the loading of freight, were represented by orange wood sticks. Tiny files and cuticle knives served as standards from which hung little sponge life boats. A small nail brush represented the bridge. Even the

anchor was not overlooked, but was cut from a piece of sponge and hung on the outside of the ship. When the model was completed it was set on a white face cloth, which represented extremely well the foamy water on which the ship was floating.

The description of this project is given merely as an example. No one may follow definitely and formally

that which is done by another. What one does can only suggest to another what may be done by adaptation to local situations. It does serve, however, to illustrate the correlation of health with other school subjects and must suggest to health teachers a new and vital interest in cleanliness which would follow the discussions and the actual work entailed.

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## PUBLIC HEALTH ENGINEERING

T. J. LAFRENIÈRE, C.E. AND A. E. BERRY, C.E., PH.D.

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### *Engineering Projects in Saskatchewan*

THE new deep well which was constructed last year to augment the water supply for the town has now been connected to the waterworks system. The well is capable of delivering 150,000 gallons per day and the town water supply is now in a more satisfactory position than it has been in for some years. A chlorinating plant has been installed in the pumping station within the last few weeks.

Canora is undertaking extensions in connection with its waterworks system, with a view to supplying additional water to the town and to the Canadian National Railway Company.

Assiniboia is constructing a domestic sewerage system in the principal business and residential streets of the town. This work, in addition to helping out considerably with the relief situation, will prove to be a great

health asset to the town, inasmuch as Assiniboia has had a waterworks system in operation for a number of years with no proper method of disposing of waste liquids.

Weyburn: The city is at present constructing a new sewage disposal plant on the activated sludge system. The original plant was unable to cope with the greatly increased flow; due to the sewage, from the Provincial Mental Hospital.

Saskatoon is being urged by the Rural Municipality of Cory, which lies immediately down stream from the city, to construct a modern plant for the treatment of the city's sewerage. The recent census shows Saskatoon to have a population of over 43,000 and the city council is at present considering ways and means of installing sewage treatment works.

## NEWS OF THE SECTION

THE membership campaign recently inaugurated to bring in new members to the Public Health Engineering Section is meeting with success. Already a good number have come in and it is expected that registration in this section will be greatly increased by the time of the Annual Convention.

Tenders have been called for the construction of an incinerator for the city of Ottawa. The site chosen is very suitable as well as being fairly central. The sanitary disposal of garbage on dumps in large communities is very difficult. Consequently it is not surprising to find Ottawa embarking on an incineration programme.

Hamilton has also recently undertaken a similar project.

Preparations are now being made for the spring meeting of the Canadian Section, American Water Works Association. The dates chosen are March 9th, 10th, 11th, 1932, and the place of the convention is the General Brock Hotel, Niagara Falls, Ontario. A programme of interest to Waterworks and Public Health Officials has been planned.

A major programme of waterworks improvements, involving an expenditure in excess of 10 million dollars within the next three years, is planned for the city of Montreal. This comprises a reservoir, pumping equipment and filtration and piping.

## CORRESPONDENCE

**Racial Origin in Vital Statistics**

TO THE EDITOR.

Dear Sir:

In the December issue there is a paper by the Director of Vital Statistics for Saskatchewan under the above named title. It is apparent that the author, like the correspondents he quotes, confuses racial origin with nationality.

Racial origin in reference to persons is defined as "lineage, ancestry, family kindred," the descent being in the male line.

Nationality means "pertaining to the place, country or region where anyone was born."

In the registration forms for birth (in Ontario at least) there is no ques-

tion asked respecting the racial origin of the child. There is the very proper question respecting the racial origin of the father and mother.

The vital statistics of a country are of great value and their value is proportionate to their truth. A record which sets down the racial origin of the parents as Canadian, where the remote ancestry is British, French, or Japanese, for example, is not valuable because it is not true. It may be objected that it is often difficult to discover the remote ancestry. Again the record is valuable in proportion to the truth discovered.

The record of a child born in Canada is proof of Canadian nationality, if there is such a thing; the record of the parents' racial origin is another matter altogether. There are thou-

sands of children of Japanese parent-origin born in China, India, etc. No one would think of classing such children as Chinese or Indian. A young medical man of the writer's acquaintance, born in Korea of British ancestry, was able freely to enter Canada because his ancestry, *i.e.*, his racial origin, was truly set out in his birth registration. Otherwise he would

have been debarred. There are thousands of children of Japanese parentage born in California. Is their racial origin the so-called American? The reference to racial origin in the birth registration is likely to survive, not only because it is useful, but also because it is (approximately) true.

JOHN W. S. McCULLOUGH.  
December 29th, 1931.

REPORTED CASES OF CERTAIN COMMUNICABLE DISEASES IN CANADA\*  
BY PROVINCES—DECEMBER, 1931.

Diseases	P.E.I.	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia
Diphtheria.....	1	36	32	229	274	89	43	1	28
Scarlet Fever..	—	72	112	356	468	134	9	24	37
Measles.....	—	—	—	816	2428	146	190	1	282
Whooping Cough.....	—	85	1	183	578	106	25	13	99
German Measles.....	—	—	—	12	23	†	1	—	33
Mumps.....	—	208	—	123	464	131	30	6	96
Smallpox.....	—	1	—	2	6	—	27	10	—
Cerebrospinal Meningitis.....	—	—	—	2	4	1	1	—	—
Anterior Poliomyelitis.....	—	—	—	—	—	—	—	—	—
Typhoid Fever.....	—	5	11	44	54	12	1	2	4
Trachoma.....	—	—	—	—	—	403	1054	—	—

\*Data furnished by the Dominion Bureau of Statistics, Ottawa.

†Not reportable.

## NEWS AND COMMENTS

P. A. T. SNEATH, M.D., D.P.H.

### British Columbia

**H**AEMORRHAGIC smallpox has made its appearance in Vancouver and seven deaths have already occurred.

Preliminary figures of the census show British Columbia with a population of 689,210 for 1931, an increase of over 31 per cent, the largest provincial increase in Canada in the decade.

The maternal mortality rate in 1930 was 5.8 per thousand living births, or 11 per 100,000 population. At least

18 of the 63 maternal deaths were due to sepsis.

Miss G. M. Kitteringham, Reg.N., has resigned the position of public health nurse at Oliver, B.C., and is succeeded by Miss Craig.

The 35th annual report of the Provincial Board of Health for the year July 1930-June 1931 is now ready for distribution, as is also the 59th annual report on vital statistics.

The members of the British Colum-

bia Medical Association have been advised individually against identifying themselves with the British Columbia Medical and Health Indemnity Insurance Company. This company is offering general sickness insurance with provision of medical services. The fees suggested are in general similar to those of the Workmen's Compensation Board.

A Royal Commission is at present investigating drugless healing and other irregular practices.

#### Alberta

THE University of Alberta Hospital, Edmonton, is now on the list approved by the American Dietetic Association for dietetic internship.

Agitation for complete pasteurization has been carried on lately in Calgary. In spite of the able advice of the Medical Officer of Health, Dr. Duncan Gow, the City Council postponed final action in this regard.

New regulations providing that rural patients, with the exception of special emergency patients, may be admitted to hospitals only by making a cash payment to cover the estimated hospital account or by furnishing an order signed by a councillor or the secretary-treasurer of the district from which the patient comes, have enabled the Municipal Hospital at Coronation to continue its work. The hospital has been in operation since 1915, and since then 80 per cent of the patients have been from rural districts. So much is owed by these patients that the hospital could not carry on unless the provisions noted were made.

Dr. J. J. Wall of Ottawa has been sent to Alberta by the Department of Indian Affairs to carry on an intensive campaign against trachoma, the public health aspects of which are constantly becoming more serious.

#### Saskatchewan

THE Provincial Cancer Commission has recently opened two cancer clinics, one in the General Hospital, Regina, and one in the City Hospital, Saskatoon. A fee of ten dollars is charged for the first consultation. In cases of inability to pay, the municipality must assume the responsibility for treatment. Radiotherapy, but not surgery, will be carried on under the Commission.

The operation of the health unit at Gravelbourg has been discontinued.

#### Manitoba

THE proposal of Dr. A. T. Mathers, Dean of the Faculty of Medicine, University of Manitoba, that first year registrations in medicine be limited to fifty-five or sixty, has been formally approved by the Council and the Board of Governors. Dr. Mathers pointed out that 62 per cent of the graduates leave Manitoba, while 27 per cent leave Canada. This means that the people of Manitoba are contributing heavily to provide professional personnel for other places, as the fees of medical students by no means cover the cost of their education. Dr. Mathers also pointed out that there has been a definite increase in the registrations, with a corresponding increase in withdrawals or failures. This unsatisfactory state will be eliminated by proper selection based on residence, scholastic record, personality and general capability.

#### Ontario

THE Honourable John M. Robb, speaking at the meeting of the Hamilton Health Association recently, pointed out the menace of tuberculosis, indicating chiefly the increased rates in young women.

An addition to the Freeport Sanitorium at the cost of \$100,000 is proposed. The Dominion and Provin-

cial Governments will contribute 35 per cent of the cost. Plans are made for a \$40,000 addition to the Oshawa General Hospital. Accommodation for 300 additional beds has recently been provided at the Ontario Hospital for Epileptics in Woodstock. Tuberculosis beds to the number of 100 have been provided for the northern district by the conversion of the Misericordia Hospital at Haileybury into a sanitorium.

#### Quebec

**D**R. Alphonse Lessard, Director of the Provincial Bureau of Health and Public Charities, visited Toronto recently.

#### New Brunswick

**D**R. George Melvin has resigned as Chief Medical Officer for New Brunswick and is now recuperating his health in California. Dr. Melvin was appointed in 1918 and is

very well known in public health service.

Dr. William Warwick, formerly District Medical Health Officer for the southern district, has been appointed Chief Medical Officer, succeeding Dr. Melvin. Dr. Warwick's work in the southern district has been outstanding and his appointment and promotion are well merited and made with the entire approval of the profession and of the public.

In December fire damaged the Jordan Memorial Hospital at Riverglade to the extent of \$100,000. The buildings will probably be replaced in the summer.

#### Nova Scotia

**T**HE Falconwood Hospital for the Insane, near Charlottetown, was entirely destroyed by fire in December. Two patients lost their lives. Water pressure proved totally inadequate. The loss is about \$400,000.

#### HON. DR. FORBES ELLIOTT GODFREY

After a protracted illness, the Hon. Dr. Forbes Elliott Godfrey passed away on January 6th last, at his home in Mimico, Ontario. The son of the Rev. Robert Godfrey and Mary Elliott, the late Dr. Godfrey was born in York Township on March 31, 1868. He received his preliminary education in Owen Sound and graduated in Medicine from the University of Toronto in 1889, winning the General Proficiency Medal. He then went to Scotland and obtained the qualifications of L.R.C.P. & S., Edinburgh, and L.F.P. & S., Glasgow. On his return to Canada he settled in Mimico.

After his medical practice was assured, he turned his attention to public life, which had always attracted him, and became increasingly prominent in Conservative circles in West York, being elected member for that constituency in 1907 and winning re-election in the years 1908, 1911, 1919, 1923, 1926 and 1929. His was the record of having held a seat in parliament for a longer continuous period than any other member. In 1923 Dr. Godfrey was appointed Minister of Health and Labour in the Ontario Government. Owing to ill-health he was forced to resign this portfolio in 1930.

To public health work he brought the same zealous spirit which had characterized the many years of his active medical practice. He was deeply interested in the advancement of medical science, and in his public addresses used every opportunity to support the interests of medical research. As Honorary President of the Canadian Public Health Association for many years, Dr. Godfrey gave most generous support. To Mrs. Godfrey and her daughter the Association extends its sympathy in their great loss.

## Books and Reports

D. T. FRASER, B.A., M.B., D.P.H.; R. R. McCLENAHAN, B.A., M.B., D.P.H.

**Annals of the Pickett-Thomson Research Laboratory. Volume VI, The Role of the Pathogenic Streptococci in Scarlet Fever. Volume VII, The Role of the Pathogenic Streptococci in Erysipelas, Skin Diseases and Measles.** Published for the Pickett-Thomson Research Laboratory, St. Paul's Hospital, 24 Endell Street, London, W.C. 2, by Baillière, Tindall & Cox, 7 & 8 Henrietta Street, Covent Garden, London, W.C. 2; in America, The Williams and Wilkins Company, Baltimore, Maryland, 1930 and 1931. Volume VI, 470 pages; Volume VII, 441 pages. Price (each), £2 2s. net—\$10.00.

The editors of the Annals of the Pickett-Thomson Research Laboratory have set themselves a Herculean task. In the Volume (VI) devoted to the rôle of the streptococci in scarlet fever, they have referred in the text to some 1,400 research papers. In Volume VII, which deals with the rôle of streptococci in erysipelas, skin diseases and measles, 1,600 references are given. Before the series is completed, it is contemplated that seven or eight volumes will be issued which pertain to the streptococcus alone, with some 10,000 references to literature on the subject. The amount of work entailed is staggering.

The conclusion is reached, from the thousands of photographs already taken, that there exist several hundreds of varieties of streptococci which the editors hope will eventually be classified into some twenty or thirty

groups. To quote from the preface of Volume VII, "We would like to point out that these Volumes are of the nature of an encyclopædia of bacterial research, in which we have attempted to epitomise, classify, and correlate the thousands of research papers published by research workers all the world over."

The microphotographs are beautiful. Each Volume contains an author's and a subject index.

**The Prevention of Disease in the Community.** By Curtis M. Hilliard. Publishers, The McGraw-Hill Book Company, Inc., New York and London. 1931. 193 pages. Price \$1.75.

This book outlines in a comprehensive way the factors concerned in the control of communicable diseases and the means by which such control may be effectively instituted. Though written expressly for students in colleges, nursing schools, etc., it is also admirably suited to the intelligent reader of whatever profession or calling. The author has achieved a nice balance between the historical development of his subject matter and the presentation of the known and proven facts of prevention. What is most pleasing about the book is the critical attitude of the author in the selection of his material. The book is excellent.

D. T. F.

**Child Health and the Community.** By Courtenay Dinwiddie. Publishers, The Commonwealth Fund, New York. 88 Pages. Price, \$1.00.

This small monograph is published by the Commonwealth Fund, an organization privately financed and concerned with the improvement of health conditions in the United States. It gives a short report of child health demonstrations and public health activities carried out in four widely separated parts of the country under the supervision and at the expense of the Fund. The four centres chosen were Fargo, North Dakota; Athens, Georgia; Rutherford County, Tennessee; and Marion County, Oregon. The demonstrations, therefore, were confined to smaller cities and rural communities.

Each demonstration has been fully described in other publications, and this monograph is concerned only with the broad outlines of procedure and certain common difficulties. The value of close co-operation between the general practitioner and the health authorities is pointed out. A committee of the medical society was consulted before any action of moment

was started, and the hearty active assistance of the medical profession thus secured.

The value of the education of the public and of the enlistment of the services of the volunteer worker and of lay individual generally, through local organizations, is strongly stressed. The value of using school pupils as teachers in the home is again shown.

The book is of value to all those engaged in public health work, but will be particularly useful to those who are working in county health units and in similar demonstrations. It is well printed, and the illustrations are pertinent, clear and distinct.

R. R. McC.

*Editorial Note:* Dr. Roy McClenahan's many friends will be glad to note the above book review, which was written by him. By reason of a protracted illness, he has been a patient at Christie Street Hospital, Toronto, for several years.

## BOOKS RECEIVED

*A Doctor's Advice to His Son.* By Keith F. Rogers, M.D., C.M. Publishers, The Ryerson Press, 299 Queen Street West, Toronto, 1931. 71 pages. Price, \$1.00.

*Diphtheria, Its Distribution and Prevention.* By J. Graham Forbes, M.D., F.R.C.P., D.P.H. With an introductory note by Sir Frederick Andrewes, M.D., F.R.S. Publishers, John Bale, Sons and Danielsson, Ltd., 83-91 Gt. Titchfield Street, London, W.1, 1931. 832 pages. Price, 45/-, \$10.00.

*Cancer, What Everyone Should Know About It.* By James A. Tobey, Dr. P.H. Publisher, Alfred A. Knopf, 730 Fifth Avenue, New York City, 1932. 310 pages. Price, \$3.00.

*Annual Report of the Surgeon-General of the Public Health Service of the United States.* Publisher, United States Govern-

ment Printing Office, Washington, D.C., 1931. 354 pages. Price, 85c.

*Protective Measures Against Dangers Resulting from the Use of Radium, Roentgen and Ultra-violet Rays.* By Professor Hermann Wintz, M.D., Ph.D. Publishers, Health Organization, League of Nations, Geneva, August, 1931. 114 pages. Price, 3/-, 75c. Series of League of Nations Publications III, Health, 1931, III, 9.

*European Conference on Rural Hygiene.* Recommendations on Principles Governing the Organization of Medical Assistance, the Public Health Services and Sanitation in Rural Districts. Publishers, Health Organization, League of Nations, Geneva, July, 1931. 59 pages. Price, 2/-, 50c. Series of League of Nations Publications, III, Health, 1931, III, 11<sup>1</sup>.

